# ATTACHMENT 1

# EXHIBIT 11

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1           UNITED STATES DISTRICT COURT

2         NORTHERN DISTRICT OF CALIFORNIA

3              SAN JOSE DIVISION

4

5    CISCO SYSTEMS, INC.,        )
                                 )
6             Plaintiff,         )
                                 ) Case No.
7         vs.                    ) 5:14-cv-05344-BLF  (PSG)
                                 )
8    ARISTA NETWORKS, INC.,      )
                                 )
9             Defendant.         )
     _____ )

10

11

12    *** HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY ***

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14

15    VIDEOTAPED DEPOSITION OF RAMANATHAN KAVASSERI

16              Palo Alto, California

17         Tuesday, February 23, 2016

18                 Volume I

19

20

21

22    Reported by:

      CARLA SOARES

23    CSR No. 5908

24    Job No. 2216982

25    Pages 1 - 195

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| 1 UNITED STATES DISTRICT COURT<br>2 NORTHERN DISTRICT OF CALIFORNIA<br>3 SAN JOSE DIVISION<br>4<br>5 CISCO SYSTEMS, INC., )<br>         )<br>6     Plaintiff, )<br>        ) Case No.<br>7   vs.    ) 5:14-cv-05344-BLF (PSG)<br>        )<br>8 ARISTA NETWORKS, INC., )<br>        )<br>9     Defendant. )<br>  _____ )<br>10<br>11<br>12<br>13<br>14<br>15<br>16    VIDEOTAPED DEPOSITION OF RAMANATHAN<br>17 KAVASSERI, Volume I, taken on behalf of Defendant,<br>18 at 601 California Avenue, Palo Alto, California,<br>19 beginning at 10:09 a.m., and ending at 4:26 p.m., on<br>20 Tuesday, February 23, 2016, before CARLA SOARES,<br>21 Certified Shorthand Reporter No. 5908.<br>22<br>23<br>24<br>25<br>                          Page 2 | 1 APPEARANCES (Continued):<br>2<br>3 For the Witness:<br>4    FARELLA BRAUN & MARTEL LLP<br>5    BY: RODERICK M. THOMPSON, Attorney at Law<br>6    Russ Building<br>7    235 Montgomery Street<br>8    San Francisco, California 94104<br>9    415.954.4400<br>10   rthompson@fbm.com<br>11<br>12<br>13 ALSO PRESENT: Ramon Peraza, Video Operator<br>14<br>15       --oOo--<br>16<br>17<br>18<br>19<br>20<br>21<br>22<br>23<br>24<br>25<br>                          Page 4 |
| 1 APPEARANCES:<br>2<br>3 For the Plaintiff:<br>4    QUINN EMANUEL URQUHART & SULLIVAN, LLP<br>5    BY: MARK TUNG, Ph.D., Attorney at Law<br>6    555 Twin Dolphin Drive, 5th Floor<br>7    Redwood Shores, California 94065<br>8    650.801.5016<br>9    marktung@quinnemanuel.com<br>10<br>11<br>12 For the Defendant:<br>13   KEKER & VAN NEST LLP<br>14   BY: EDUARDO E. SANTACANA, Attorney at Law<br>15   BY: RYAN WONG, Attorney at Law<br>16   633 Battery Street<br>17   San Francisco, California 94111<br>18   415.391.5400<br>19   esantacana@kvn.com<br>20   rwong@kvn.com<br>21<br>22<br>23<br>24<br>25<br>                          Page 3 | |

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| | EXHIBITS | |
|---|---|---|
| 1 | | |
| 2 | NUMBER          DESCRIPTION          PAGE | |
| 3 | Exhibit 329 Document headed "Commands for | 94 |
| 4 | which Cisco listed Ramanathan | |
| 5 | Kavasseri as 'Author/Originator' | |
| 6 | in Cisco's response to Interrogatory | |
| 7 | No. 16, Exhibit F (January 12, 2016)" | |
| 8 | | |
| 9 | Exhibit 330 Document labeled "Ram Kavasseri, | 101 |
| 10 | Garry Horoupian," dated 2/8/06, | |
| 11 | Bates CSI-CLI-00682250 - 2314 | |
| 12 | | |
| 13 | Exhibit 331 Document labeled "Parser Police: | 122 |
| 14 | Where can we go from here?" | |
| 15 | Bates CSI-ANI-00031041 - 0032 | |
| 16 | | |
| 17 | Exhibit 332 Document headed "Hot ICE Product | 129 |
| 18 | Requirements Document," | |
| 19 | Bates CSI-CLI-00662062 - 2085 | |
| 20 | | |
| 21 | Exhibit 333 Document headed "Unprintable | 132 |
| 22 | File," | |
| 23 | first page Bates CSI-CLI-00358160 | |
| 24 | | |
| 25 | | |

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| | REFERENCED EXHIBITS |
|---|---|
| 1 | |
| 2 | (Not attached) |
| 3 | Exhibit/Page |
| 4 | 92   89 |
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| | EXHIBITS | |
|---|---|---|
| 1 | | |
| 2 | NUMBER          DESCRIPTION          PAGE | |
| 3 | Exhibit 334 Document headed "User-based | 149 |
| 4 | Security Model (USM) for version 3 | |
| 5 | of the Simple Network Management | |
| 6 | Protocol (SNMPv3)," dated 1/1998 | |
| 7 | | |
| 8 | Exhibit 335 Document headed "View-based | 151 |
| 9 | Access Control Model (VACM) for | |
| 10 | the Simple Network Management | |
| 11 | Protocol (SNMP)," dated 1/1998 | |
| 12 | | |
| 13 | Exhibit 336 Document headed "An Architecture | 154 |
| 14 | for Describing SNMP Management | |
| 15 | Frameworks," dated 1/1998 | |
| 16 | | |
| 17 | Exhibit 337 Document headed "Doc Number | 159 |
| 18 | ENG-28473," | |
| 19 | Bates CSI-CLI-00609071 - 9083 | |
| 20 | | |
| 21 | Exhibit 338 Document entitled "Cisco IOS | 172 |
| 22 | Network Management Command | |
| 23 | Reference," dated 10/2009, | |
| 24 | Bates CSI-CLI-00319765 - 1101 | |
| 25 | | |

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| | |
|---|---|
| 1 | Palo Alto, California                09:21:40 |
| 2 | Tuesday, February 23, 2016 |
| 3 | 10:09 a.m. |
| 4 | |
| 5 | P R O C E E D I N G S               09:21:40 |
| 6 | THE VIDEO OPERATOR: Good morning. We are |
| 7 | on the record at 10:09 a.m. on February 23rd, 2016. |
| 8 | This is the videotaped deposition of Mr. Ramanathan |
| 9 | Kavasseri. |
| 10 | My name is Ramon Peraza, here with our        10:09:15 |
| 11 | court reporter, Carla Soares. We're here from |
| 12 | Veritext Legal Solutions at the request of counsel |
| 13 | for the defendant. |
| 14 | This deposition is being held at Wilson |
| 15 | Sonsini in Palo Alto. The caption of this case is    10:09:26 |
| 16 | Cisco Systems, Inc., versus Arista Networks, Inc., |
| 17 | Case No. 5:14-cv-05344-BLF (PSG). |
| 18 | Please note that audio- and |
| 19 | video-recording will take place unless all parties |
| 20 | have agreed to go off the record. Microphones are    10:09:50 |
| 21 | sensitive and may pick up whispers or private |
| 22 | conversations. |
| 23 | At this time, Counsel, please identify |
| 24 | yourselves for the record and state whom you |
| 25 | represent.                          10:10:00 |

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|---|---|
| 1  time you worked at Cisco?                          10:59:08<br>2      A   The definition of "team" here is vague.<br>3      Q   Okay.  And I apologize.  I should have<br>4  asked you that question.<br>5          So you said that when you first joined       10:59:20<br>6  Cisco, you joined the SNMP team.  What did you mean<br>7  by that?<br>8      A   I joined a team whose primary<br>9  responsibility was working to develop and maintain<br>10  the SNMP protocol.                                10:59:34<br>11     Q   Does that team have a name?<br>12     A   It's so long ago, I don't remember the<br>13  exact name apart from probably it was SNMP.<br>14     Q   It probably was not SNMP?<br>15     A   It probably was SNMP for all I know.        10:59:51<br>16     Q   It probably was SNMP?<br>17     A   Yeah.<br>18     Q   Did that team have responsibilities other<br>19  than implementing the SNMP protocol?<br>20     A   Yes.                                         10:59:59<br>21     Q   What other responsibilities did it have?<br>22     A   Its responsibilities included reviewing<br>23  extensions to the SNMP protocol submitted by other<br>24  protocol teams within Cisco.<br>25     Q   Did the team have any other                  11:00:29<br><div align="right">Page 46</div> | 1  standard by the IETF and is developed by multiple    11:02:13<br>2  vendors, and everybody implements that.  And many<br>3  management protocols use it as a standard way of<br>4  querying information from devices that are<br>5  networked.                                         11:02:36<br>6      Q   Do you know when SNMP was developed as an<br>7  industry standard protocol?<br>8      A   That's -- could you rephrase that<br>9  question, please?<br>10     Q   Sure.                                        11:03:37<br>11         Was SNMP an industry standard protocol<br>12  when you started working at Cisco?<br>13     A   Yes, it was.<br>14     Q   And do you recall when the IETF made it an<br>15  industry standard protocol?                       11:03:59<br>16     A   I don't believe that is a true -- I don't<br>17  believe that's a valid question.<br>18     Q   Okay.  Why is that?<br>19     A   I don't believe the IETF has any control<br>20  over whether a protocol is industry standard or not.  11:04:15<br>21     Q   Okay.<br>22     A   It defines the protocol, and it's industry<br>23  standard only after companies pick it up and support<br>24  it.<br>25     Q   So SNMP was an industry standard protocol   11:04:25<br><div align="right">Page 48</div> |
| 1  responsibilities other than that?                  11:00:30<br>2      A   The team was encouraged to participate in<br>3  the IETF to define use standards around SNMP and<br>4  network management.<br>5      Q   Any other responsibilities?                  11:00:47<br>6      A   Not that I can recollect easily at this<br>7  time.<br>8      Q   What does SNMP stand for?<br>9      A   I better nail this one, right?  Simple<br>10  network management protocol.                       11:01:17<br>11     Q   Okay.  And is it fair to say that you<br>12  first became familiar with the protocol when you<br>13  started working at Cisco?<br>14     A   That is correct.<br>15     Q   Okay.  While you were working at Cisco,      11:01:31<br>16  did you become familiar with any other routing<br>17  protocols as part of your work?<br>18     A   Not that I recall right away, but I'm<br>19  pretty sure based on the nature of my work that I<br>20  would have interacted with multiple protocols.  The   11:01:52<br>21  specific ones don't jump to mind.<br>22     Q   Is SNMP an industry standard protocol?<br>23     A   Yes, it is.<br>24     Q   How do you know that?<br>25     A   It is a protocol that was defined as a       11:02:11<br><div align="right">Page 47</div> | 1  because multiple vendors used it?                   11:04:28<br>2      A   Yes, used a compliant version of it.<br>3      Q   Okay.  And a compliant version was a<br>4  version that complied with the definitions IETF<br>5  provided?                                          11:04:41<br>6      A   Correct.<br>7      Q   And IETF stands, just so we have it on the<br>8  record, for Internet engineering task force,<br>9  correct?<br>10     A   Yes.                                         11:04:51<br>11     Q   You said that you were encouraged or your<br>12  team was encouraged to participate in IETF, correct?<br>13     A   Correct.<br>14     Q   Was there a particular group at the IETF<br>15  that you were encouraged to participate in, or       11:05:49<br>16  subject area?<br>17     A   SNMP.<br>18     Q   Yes?<br>19     A   Yes.<br>20     Q   SNMP.  Anything else?                        11:06:09<br>21     A   Not explicitly encouraged, as far as I<br>22  know.  Not discouraged, either.  So very neutral on<br>23  that.<br>24     Q   How was your team encouraged by Cisco to<br>25  participate in the IETF?                           11:06:36<br><div align="right">Page 49</div> |

<div align="right">13 (Pages 46 - 49)</div>

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|---|---|
| 1   Q   Sure.     11:37:17 | 1   don't recall the features that I was working on, so   11:40:26 |
| 2    The functional specifications that you | 2   I don't recall specifically what I would have done |
| 3   reviewed when developing SNMP features, would that | 3   to compare. |
| 4   specification have been written by someone at Cisco? | 4   Q   I see. |
| 5   A   Yes.     11:37:27 | 5    Was it part of your process in developing   11:40:35 |
| 6   Q   And did you -- were you involved in | 6   features to review what other vendors were doing to |
| 7   writing any functional specifications? | 7   implement the same features? |
| 8   A   Yes, I was. | 8   A   Other -- so in the space that we worked |
| 9   Q   Was that for the features that you were | 9   with SNMP, vendors contributed to the IETF document |
| 10   implementing?     11:37:36 | 10   so it wasn't as necessary to look at their   11:40:59 |
| 11   A   Yes, it was. Yes, it was. | 11   implementations because they were there telling us |
| 12   Q   Do you recall right now which functional | 12   what they were trying to build. That was the whole |
| 13   specifications you may have written? | 13   point of building an industry standard. |
| 14   A   Not off the top of my head, no. | 14    Also, Cisco was on the leading edge of |
| 15   Q   Did the GEM methodology involve reviewing   11:37:57 | 15   implementing the protocols as they were being   11:41:11 |
| 16   IETF documents? | 16   developed. In a few cases, we would have the |
| 17   A   As far as I recall, no. | 17   implementations before the protocols were released |
| 18   Q   Did you review IETF documents when you | 18   because we were helping author the protocol. |
| 19   were implementing SNMP features? | 19    So at that point, looking at other vendors |
| 20   A   That is a broad question. If the feature   11:38:12 | 20   was not possible because they had not done the   11:41:24 |
| 21   had anything specific to do with an IETF document, | 21   implementations or released the implementations, |
| 22   then yes, I would have had to review the document to | 22   which is why I was being very specific in saying, I |
| 23   make sure I was implementing it correctly, "it" | 23   don't recall the exact features I was working on. |
| 24   being whatever I was working on. | 24    But my answer would change depending on |
| 25   Q   Okay. And that is something -- you would   11:38:26 | 25   what I was working on and depending on whether   11:41:37 |
| Page 62 | Page 64 |
| 1   have reviewed an IETF document relating to a feature   11:38:31 | 1   somebody had done something in the field.   11:41:40 |
| 2   you were implementing before you implemented the | 2   Q   I understand. |
| 3   feature; is that right? | 3    Who else worked on the team that was |
| 4   A   If there was an IETF document associated | 4   implementing SNMP features at Cisco? |
| 5   with what I was working on and I was required to   11:38:41 | 5   A   I don't remember all the names, but my   11:41:58 |
| 6   implement part or the whole part of that IETF | 6   manager was John Hopprich. My technical lead and |
| 7   document, then yes, I would have reviewed that IETF | 7   mentor, Jeff -- Jeffrey Johnson. I had it for a |
| 8   document before I implemented the feature. | 8   moment and it went away there. Sandra Durham was |
| 9   Q   Were there features that you developed at | 9   one of my peers. |
| 10   Cisco relating to SNMP that were not defined by an   11:38:56 | 10    Anke Dosedal was also one of my team   11:42:34 |
| 11   IETF document? | 11   members. Robert Stewart, who went by the moniker |
| 12   A   I don't have specifics, but I think that's | 12   Bob, Bob Stewart, was also one of my peers. |
| 13   a fair generalization, that there are parts of | 13    Hold on. There's one more. Scott |
| 14   our -- the Cisco SNMP implementation that were not | 14   Mordock, M-O-R-D-O-C-K. Now, I can't recall if |
| 15   described in any part of any IETF document because   11:39:32 | 15   Scott was on the team when I joined or joined later.   11:43:03 |
| 16   it was internal to how our product worked at the | 16   He was I think at Cisco when I joined, but I'm not |
| 17   time. | 17   sure at what point he was part of the SNMP team or |
| 18   Q   So -- okay. When you were developing | 18   not. Long time ago. |
| 19   features related to SNMP at Cisco, did you also | 19    So those are the names that come to mind. |
| 20   review what other vendors were doing?   11:40:04 | 20   Q   What was John Hopprich's role on the team?   11:43:23 |
| 21    MR. TUNG: Objection. Vague. | 21   A   He was my manager. |
| 22    THE WITNESS: I do not recall. | 22   Q   And were the rest of the names, apart from |
| 23   BY MR. SANTACANA: | 23   John Hopprich and Jeff Johnson, were they also |
| 24   Q   You don't recall either way? | 24   software engineers? |
| 25   A   I would like to change my answer to, I   11:40:23 | 25   A   Yes.     11:43:36 |
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|---|---|
| 1    Q  If you take a look at the last command in        14:41:36 | 1  at 2:44 p.m.                                    14:44:02 |
| 2  this table, "snmp-server user," do you know whether | 2        (Recess, 2:44 p.m. - 3:05 p.m.) |
| 3  you authored that command? | 3        THE VIDEO OPERATOR:  We are back on the |
| 4    A  Define what you mean by "authored that | 4  record at 3:05 p.m. |
| 5  command."                                   14:41:55 | 5  BY MR. SANTACANA:                         15:05:39 |
| 6    Q  Do you know whether you are the one who | 6    Q  Mr. Kavasseri, we left off talking about |
| 7  came up with the sequence of words that resulted in | 7  the "snmp-server user" command, and you testified |
| 8  this command, "snmp-server user"? | 8  that "snmp-server" came from a prior command in IOS |
| 9    A  I cannot be definitive about it. | 9  at the time? |
| 10    Q  Who else do you recall working with on       14:42:07 | 10    A  No, I said that I don't know how it came       15:05:56 |
| 11  this project that resulted in these eight commands? | 11  about.  It was already there when I joined Cisco. |
| 12    A  I would probably have reviewed this with | 12    Q  And its inclusion in this command for |
| 13  my team members.  And so I can't -- the reason I | 13  which you are named the author, it's included there |
| 14  answered the way I did is, I don't know if I came up | 14  because it was already part of IOS? |
| 15  with the word "user" or somebody else came up with      14:42:25 | 15    A  It was a root part of the command to which      15:06:12 |
| 16  the word "user."  So I'm not sure in hindsight. | 16  I added extensions. |
| 17    Q  Did you come up with the term | 17    Q  And the root was in IOS before you started |
| 18  "snmp-server"? | 18  working at Cisco? |
| 19    A  Absolutely not. | 19    A  To the best of my knowledge, it was |
| 20    Q  Okay.  How do you know that?              14:42:39 | 20  already there before I started.              15:06:23 |
| 21    A  It was there before I joined. | 21    Q  And the term "user" is a term that comes |
| 22    Q  It was where? | 22  from the SNMP industry standard? |
| 23    A  It was in the IOS CLI before I joined | 23    A  I'm not sure I'd say it exactly that way. |
| 24  Cisco. | 24  The term "user" relates to parts of the SNMP V3 |
| 25    Q  Okay.  And so the addition to that term      14:42:48 | 25  protocol, yes.                               15:06:48 |
| Page 146 | Page 148 |

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|---|---|
| 1  that was new was the word "user"?               14:42:52 | 1    Q  Is that a term that the protocol uses?       15:06:49 |
| 2    A  Yes | 2    A  I believe so, but I -- if you have a copy |
| 3    Q  Okay  And do you know where that word | 3  of the reference, I could take a look. |
| 4  came from? | 4    Q  Sure.  Of course. |
| 5    A  The SNMP V3 protocol specification has a       14:43:00 | 5        THE VIDEO OPERATOR:  Exhibit 334.          15:07:03 |
| 6  definition of roles, if I remember right, and users | 6        (Exhibit 334 was marked for identification |
| 7  and groups are in the protocol | 7        and is attached hereto.) |
| 8    Q  So the term "user" came from the | 8  BY MR. SANTACANA: |
| 9  protocol -- came from the industry standard | 9    Q  Exhibit 334 is RFC 2274 titled "User-based |
| 10  protocol?                                    14:43:21 | 10  Security Model (USM) for version 3 of the Simple       15:07:17 |
| 11    A  Yes | 11  Network Management Protocol (SNMP V3)." |
| 12        MR TUNG:  Objection  Mischaracterizes | 12        Do you know, sir, if this is an RFC that |
| 13        THE WITNESS:  It referred to what was in | 13  you reviewed when you were -- |
| 14  the protocol, yes | 14    A  Yes.  Let me -- I'm pretty sure this was |
| 15  BY MR SANTACANA:                            14:43:29 | 15  an RFC I reviewed because I ended up implementing       15:07:39 |
| 16    Q  And the protocol uses the word "user"? | 16  parts of it. |
| 17    A  I've got to go read the protocol to be | 17    Q  And just to be clear, it's an RFC that you |
| 18  absolutely sure | 18  reviewed when you were implementing the eight |
| 19    Q  Okay | 19  commands in Exhibit 329? |
| 20    A  After this, can we take a break?         14:43:51 | 20    A  Seven.  I'm not sure about "snmp host."       15:07:53 |
| 21    Q  Of course | 21    Q  Okay.  So this is something you would have |
| 22        If you want, we can take a break right | 22  reviewed before you proposed those command names? |
| 23  now | 23    A  Yes, that's correct. |
| 24    A  Fantastic | 24    Q  And does this document use the term "user" |
| 25        THE VIDEO OPERATOR:  We are off the record       14:44:01 | 25  in the same way that the "snmp-server user" command       15:08:13 |
| Page 147 | Page 149 |

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| | |
|---|---|
| 1 uses it? 15:08:17 | 1 Q Is this a document you reviewed when you 15:12:26 |
| 2 A I would have to read it. Give me a minute | 2 were preparing to implement the commands in |
| 3 to -- | 3 Exhibit 329? |
| 4 Can you rephrase or repeat the question, | 4 A I believe it would have been something I |
| 5 please? 15:09:11 | 5 reviewed before I implemented the commands 15:12:35 |
| 6 Q This RFC 2274, does this document use the | 6 Q And if you flip to page 3 of the document, |
| 7 term "user" the same way that you used the term | 7 under Section 2 1 titled "Groups," the first |
| 8 "user" in "snmp-server user"? | 8 paragraph defines the term "group" as follows: "A |
| 9 A The document does not define a CLI command | 9 group is a set of zero or more securityModel, |
| 10 or -- so I will -- the term "user" seems to refer to 15:09:39 | 10 securityName tuples on whose behalf SNMP management 15:12:55 |
| 11 the same entity in both cases. But the document | 11 objects can be accessed A group defines the access |
| 12 does not tell me there needs to be a command called | 12 rights afforded to all securityNames which belong to |
| 13 "snmp-server user." | 13 that group " |
| 14 Q I understand. | 14 Does this RFC use the term "group" the |
| 15 A Okay. 15:10:09 | 15 same way that you were using it in your "snmp-server 15:13:08 |
| 16 Q So you did not come up with the term | 16 group" command? |
| 17 "user"? | 17 A I believe so |
| 18 A In which context? | 18 Q What does the "snmp-server group" command |
| 19 Q In the context of this "snmp-server user" | 19 do? |
| 20 command. 15:10:32 | 20 A Actually, even reading this document 15:13:26 |
| 21 A As I responded earlier, I'm not sure how | 21 probably won't tell me because I need to see all the |
| 22 the term "user" came about, whether it was due to a | 22 help extensions to see what it does |
| 23 group interaction or something I did or something | 23 Q Okay |
| 24 somebody else did. | 24 A So it's been a while |
| 25 Q Okay. I'd like to direct your attention 15:10:50 | 25 Q You don't recall what it does? 15:13:34 |
| Page 150 | Page 152 |

| | |
|---|---|
| 1 now to "snmp-server group," which is the next row 15:10:53 | 1 A No. 15:13:35 |
| 2 up. | 2 Q Okay. Do you recall what "snmp-server |
| 3 A Yeah. | 3 user" does? |
| 4 Q As you've testified, "snmp-server" was a | 4 A I would rather not guess at this point. |
| 5 term that was a root already present in IOS at this 15:11:03 | 5 It's been years since I used these commands. 15:13:45 |
| 6 time; is that correct? | 6 I probably would be able to figure it out |
| 7 A Yes. | 7 within about 25 minutes of touching the CLI, but |
| 8 Q The term "group," did that come from IOS | 8 it's really old, old stuff. |
| 9 as well or did it come from somewhere else? | 9 Q I understand. |
| 10 A I believe there was a concept of "group" 15:11:20 | 10 I'd like to turn your attention now to the 15:14:14 |
| 11 in this document. Let me look through it one more | 11 two commands right above that, "snmp-server engineID |
| 12 time. | 12 local" and "snmp-server engineID remote." |
| 13 Q I think you'll have more luck with this | 13 Did you author those commands? |
| 14 one. | 14 A I think I have a strong recollection that |
| 15 A Yeah, there may be a separate document for 15:11:48 | 15 I had more to do with these commands; in part, the 15:14:32 |
| 16 that. | 16 fact that there was the ID which is upper case, |
| 17 (Exhibit 335 was marked for identification | 17 which is usually not what we do in these IOS CLI |
| 18 and is attached hereto.) | 18 commands. It stands out. |
| 19 BY MR. SANTACANA: | 19 Q Typically in IOS CLI you weren't |
| 20 Q Exhibit 335 is RFC 2275 entitled 15:12:02 | 20 accustomed to seeing letters capitalized like they 15:14:52 |
| 21 "View-based Access Control Models (VACM) for the | 21 are in the term "engineID"? |
| 22 Simple Network Management Protocol (SNMP)." It's | 22 A Yes. |
| 23 dated January 1998. | 23 Q Why were they capitalized here? |
| 24 Do you recognize this document, sir? | 24 A I have no idea why I capitalized them. |
| 25 A Yes, I do. 15:12:25 | 25 Q Okay. 15:15:07 |
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39 (Pages 150 - 153)

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| | |
|---|---|
| 1    (Exhibit 336 was marked for identification    09:11:58 | 1   the same way as the commands in Exhibit 329?    15:18:29 |
| 2    and is attached hereto.) | 2    A   No, it is not. |
| 3   BY MR. SANTACANA: | 3    Q   And that's because the E is capitalized? |
| 4    Q   I'm handing you what's been marked as | 4    A   Yes. |
| 5   Exhibit 336, which is RFC 2271, dated January 1998.    15:15:10 | 5    Q   Okay. The capital ID that you find    15:18:38 |
| 6   It's titled "An architecture for Describing SNMP | 6   memorable in the commands in Exhibit 329 is the same |
| 7   Management Frameworks." | 7   capital ID as on this page 36 of -- |
| 8    Do you recognize this document? | 8    A   Correct. |
| 9    A   It's been a long time. And while the view | 9    Q   -- this RFC? |
| 10   and the user bring immediate memories, this is    15:15:42 | 10    A   Correct.    15:18:51 |
| 11   probably -- this doesn't bring back immediate | 11    Q   Does that refresh your recollection as to |
| 12   memories, but I'm sure I read it at some point. | 12   why "engineID" is the way it is in Exhibit 329? |
| 13    Q   Are you sure you read it -- | 13    A   No. |
| 14    A   I soaked in this. | 14    Q   Okay. |
| 15    Q   I'm sorry to interrupt you.    15:15:54 | 15    A   Because if ID capitalized is from here,    15:19:03 |
| 16    A   Let me -- I assume I read it. I'm not | 16   which is I think where you're leading me to, I'm |
| 17   sure. It's been a long time ago. | 17   questioning why E is also not capitalized, or S is |
| 18    Q   Is this a document you would have reviewed | 18   not capitalized. |
| 19   prior to implementing the commands in Exhibit 329? | 19    Q   The term here has no spaces in it; is that |
| 20    A   I would say yes, though there might be    15:16:21 | 20   right?    15:19:20 |
| 21   other commands that match more to the proxy that's | 21    A   "SnmpEngineID," no, it has no spaces in |
| 22   described in the document. | 22   it. |
| 23    Yeah, some of this, yes, I probably would | 23    Q   And as a software engineer, would it be |
| 24   have read to implement it. | 24   fair to say that the reason the E is capitalized |
| 25    Q   If you could flip to page -- sorry --    15:16:35 | 25   here is because there is no space but it's the    15:19:32 |
| Page 154 | Page 156 |
| 1   page 36. About a fifth of the way down the page,    15:16:38 | 1   beginning of a new term? In other words, it's    15:19:36 |
| 2   there's two dashes, and it says, "Textual | 2   CamelCase? |
| 3   Conventions used in the SNMP Management | 3    A   It is CamelCase. |
| 4   Architecture." | 4    Q   But in the Exhibit 329, there's a space, |
| 5    Do you see that?    15:16:55 | 5   so it's not in CamelCase; is that right?    15:19:45 |
| 6    A   Yeah. | 6    A   Yeah. But if it was not -- if we were |
| 7    Q   What is your understanding as someone who | 7   using CamelCase, why isn't E capitalized is the |
| 8   has participated in the IETF process of the phrase | 8   other question, right? |
| 9   "textual conventions used in the SNMP management | 9    Q   Why isn't the E capitalized? |
| 10   architecture"?    15:17:12 | 10    A   So in Exhibit 329, it's not pure CamelCase    15:19:56 |
| 11    A   It in this case to me would refer to a | 11   because "engineID," the first E is not capitalized. |
| 12   human-readable string representing a particular data | 12    Q   That's exactly my point. You didn't use |
| 13   type, and semantics around the use of that | 13   CamelCase in Exhibit 329, in the commands in |
| 14   particular data type. | 14   Exhibit 329. |
| 15    Q   So this RFC defines semantically what    15:17:55 | 15    A   In Exhibit 329, I'm not sure how    15:20:15 |
| 16   those textual conventions are; is that fair to say? | 16   "engineID" came out with a capital ID. It could |
| 17    A   It defines textual conventions as they | 17   be -- yeah. At this point I'm not sure what the |
| 18   would be used in other MIBs that import from this | 18   exact origin is. |
| 19   RFC. | 19    Q   Okay. In any case, regardless of |
| 20    Q   Okay. The first one on this page 36 is    15:18:09 | 20   capitalization, the term "engineID" is not a term    15:20:37 |
| 21   titled, without spaces, "SnmpEngineID." | 21   that you came up with, right? |
| 22    Do you see that? | 22    A   No, it's not a term that I came up with. |
| 23    A   S capital, E capital, ID capital. Yes, I | 23    Q   That's a term -- |
| 24   do see it. | 24    A   Hold on. I can't definitely answer |
| 25    Q   So it's -- the "engineID" is capitalized    15:18:26 | 25   whether the term "engineID" by itself is a term I    15:20:52 |
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40 (Pages 154 - 157)

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1 came up with for the CLI command or somebody else on     15:20:55

2 my team came up with for the CLI command

3     Q   The -- I'm sorry  I just didn't

4 understand your last answer

5        Did you coin the term "engineID"?            15:21:46

6     A   I am not certain that I coined the term

7 "engineID"

8     Q   Okay  The term appears in this document,

9 right?

10    A   "SnmpEngineID" appears in this document,     15:22:03

11 yes

12    Q   Okay  And you reviewed this document

13 before writing these command names, right?

14    A   Correct

15    Q   The last word in those two commands, the     15:22:19

16 first one, the last word is "local," and the second

17 one, the last word is "remote "

18       Do you know where those terms come from?

19    A   It's been a long time  Am I allowed to

20 look through the document to see if there's anything     15:22:35

21 with "local" and "remote" here?

22    Q   Sure

23    A   So the remote engineID, I'm trying to look

24 where in the protocol we talk about SNMP in PROMs

25 because I suspect it has to do with message exchange     15:25:39

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1     A   Not at all. I just don't recognize it          15:28:37

2 looking at it right now because it's been so long

3 ago.

4     Q   What is this document?

5     A   It's a detailed design document for the        15:29:04

6 SNMP V3 implementation that went into IOS.

7     Q   And the design document includes -- strike

8 that.

9        Do you know who the author of this --

10 sorry. Strike that.                        15:29:22

11       Do you know who the audience of this

12 document is?

13    A   Other engineers within the team or related

14 teams who have a need to know about how SNMP was

15 designed so they can maintain it.                15:29:37

16    Q   And so is it fair to say the document

17 includes information about how you intended to

18 implement SNMP V3 including some of the commands

19 that you were proposing?

20    A   Yeah.                               15:29:55

21    Q   Take a look at Section 1.4 on the first

22 page. It begins, "Must allow creation and deletion

23 of SNMP communities, users and groups via both the

24 CLI and SNMP sets."

25       When you wrote "Must allow creation and        15:30:11

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1 between two configured SNMP devices where one is     15:25:42

2 notifying the other of activity.

3     Q   That would be remote?

4     A   One would be local, one would be remote.

5     Q   And is that a feature that's provided for     15:26:04

6 in the industry standards?

7     A   I believe so. I'm not sure they use

8 remote or message authoritative. Without being able

9 to grab through -- to search through the document,

10 it's hard for me to tell you exactly where -- or     15:26:18

11 what could have triggered the use of the term

12 "remote."

13       (Exhibit 337 was marked for identification

14       and is attached hereto.)

15       MR. SANTACANA: Exhibit 337 bears the        15:27:40

16 control numbers CSI-CLI-00609071. It's titled

17 "Document Number ENG-28473, Revision B." It lists

18 the witness as the author; project manager, Dale

19 Francisco; project headline, SNMP V3 Design

20 Document.                              15:28:05

21    Q   Mr. Kavasseri, do you recognize this

22 document?

23    A   No, it's been so long ago.

24    Q   Okay. Do you have any reason to doubt

25 that you're the author of this document?          15:28:35

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1 deletion of SNMP communities, users and groups,"     15:30:13

2 what is it that has that requirement?

3     A   Can you repeat the question, please?

4     Q   What is it that you were referring to that

5 requires the -- strike that.                    15:30:30

6        You wrote that something must allow the

7 creation and deletion of SNMP communities, users and

8 groups.

9        What is the "something"?

10    A   We were striving for feature parity in        15:30:43

11 configuring SNMP through both the CLI and through

12 SNMP.

13       With SNMP V3, if I recall right, if I

14 recall correctly, one of the nice features was that

15 it allowed for SNMP MIBs that could be used to        15:31:04

16 configure SNMP.

17       So if you did a basic amount of

18 configuration of the CLI, the rest of the

19 configuration you could take care of --

20       MR. THOMPSON: Mr. Kavasseri, slow --        15:31:18

21       THE WITNESS: Slow it down? Yeah.

22       MR. THOMPSON: Thank you.

23       THE WITNESS: If you -- what SNMP V3 gave

24 us was the ability to do a seed simple configuration

25 through the command line interface, and then do the     15:31:29

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41 (Pages 158 - 161)

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| Page 162 | Page 164 |
|---|---|

1 rest of the configuration through SNMP directly 15:31:32

2 This was not possible before

3 Because it was not possible before, we had

4 never bothered with creating communities which

5 existed before SNMP V3 through SNMP So now we 15:31:46

6 needed to add that as a support feature as well

7 BY MR SANTACANA:

8 Q And the reason you needed to add the

9 ability to create and delete communities, users and

10 groups was because of the features of the industry 15:31:59

11 standard SNMP V3?

12 A I don't know whether SNMP V3 -- the

13 SNMP V3 talked about users, not communities, if I

14 remember right I think that's what we referred to

15 in the -- in getting -- things getting tricky 15:32:24

16 Even now we just had it through SNMP, so

17 only the IOS CLI was the point of record I'm not

18 sure whether I meant here that you could delete

19 stuff through SNMP that was created through the CLI

20 and now the CLI needs to be regenerated or resaved 15:32:38

21 to NV RAM

22 Q Okay I think I understand And it might

23 be clear if you flip to the page that ends in 75,

24 Section 2 7

25 Section 2 7 says, "SNMP V1/V2 versus SNMP 15:33:02

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1 team suggested, "Hey, go with the shortest string." 15:34:39

2 Because when you're talking about the

3 command line, it's all about how many characters you

4 type, or it's a lot to do with how many characters

5 you type. 15:34:51

6 Q Why is that?

7 A Well, you could type U and hit "tab," and

8 if there was no other word that started with U, IOS

9 would auto-complete to "user." So you didn't need

10 to type the whole thing. 15:35:03

11 Q Okay. If you turn to the page that ends

12 in 82, this is the end of a list of CLI commands

13 that you're proposing, and this one in particular is

14 the "snmp-server engineID" command.

15 Do you see that? 15:35:28

16 A Can you repeat that again, please?

17 Just -- I'm slowing down reading stuff already.

18 Q Of course. After the first paragraph

19 here, which carries over from the previous page,

20 there's an asterisk, and then there's the 15:35:40

21 "snmp-server engineID" command.

22 A Yeah.

23 Q And then below that you describe what the

24 command is and what it's going to do.

25 Do you see that? 15:35:49

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1 V3 -- differences, and how things work." 15:33:07

2 And then you have a list of differences

3 and how things work between the old and the new

4 versions of SNMP.

5 The first thing that you wrote was, "In 15:33:18

6 SNMP V3, 'community strings' are called 'users,'"

7 and "users" is in quotation marks. "Each 'user,'"

8 in quotation marks again, "has an access-policy,

9 which is termed a 'group,'" and the word "group" is

10 also in quotation marks, "i.e., users belong to a 15:33:31

11 group."

12 A Yep.

13 Q Does this -- strike that.

14 Does this refresh your recollection as to

15 whether the terms "users" and "group" came from the 15:33:49

16 SNMP standard?

17 A The term "user" and "group" referred to

18 concepts in the SNMP standard. Of that, I have no

19 issue with saying that.

20 The reason I hesitate is, we use the term 15:34:19

21 "user," and we could have used VACM user or any

22 other combination of "user."

23 We settled on "user." I'm not sure that

24 that was because it was directly due to looking at

25 the RFC, or somebody in parser police or within my 15:34:35

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1 A Yeah. 15:35:51

2 Q And then also it shows that local and

3 remote are optional arguments.

4 Do you see that?

5 A Where does it say local and remote are 15:36:03

6 optional arguments?

7 Q Directly under "snmp-server engineID," do

8 you see the open bracket, and then it says, "local,"

9 and then there's a vertical line, and then it says,

10 "remote"? 15:36:13

11 A So --

12 Q So it indicates that the command

13 "snmp-server engineID" could either take the local

14 argument or the -- parameter, if you will, or the

15 remote. 15:36:27

16 A No, I don't think that this is an optional

17 argument. I think there's a typo in this text here.

18 Q Okay.

19 A Because if you look at it, the first

20 bracket is an open curly brace. There is no close 15:36:34

21 curly brace.

22 I assume that -- and again, I could be

23 completely wrong on this. I assume that the -- if

24 you look at "remote ipaddress udp-port," and then

25 within angle brackets, "port," following that are 15:36:52

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42 (Pages 162 - 165)

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1 two square brackets. I think the second of those is 15:36:55
2 supposed to be a curly bracket.
3 The reason I say that is just from parser
4 theory, if you have both optional, I'm not sure how
5 a programmatic parser would know what you meant. 15:37:08
6 Q I see.
7 A There are two optional paths to go by and
8 a required path at the end.
9 Q I see. And I think I -- I didn't mean to
10 say "optional." What I meant was that the user has 15:37:23
11 an option between using local and using remote.
12 A Yeah, that is correct. That seems about
13 right.
14 Q Okay. But the command itself is
15 "snmp-server engineID"; is that fair to say? 15:37:33
16 A The root of the command is "snmp-server
17 engineID." I agree.
18 Q The first thing that you write here under
19 that command is, "For SNMP V3 authentication and
20 privacy to work, each SNMP agent needs to have its 15:37:46
21 own SNMP engine ID."
22 A Yes.
23 Q Do you see that?
24 What did you mean by that?
25 A My recollection is hazy, but my hazy 15:38:03

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1 recollection tells me that this is the key that is 15:38:05
2 used to encrypt packets going back and forth; i.e.,
3 if you change this key, you may not -- yeah. I
4 don't change the key. I have no idea what happens
5 when you change the key anymore. 15:38:21
6 Q Okay. You can set that aside.
7 You've mentioned a couple of times that
8 some commands can take the word "no" in front of
9 them.
10 A Yes. 15:38:41
11 Q Is that -- you'll see that's not listed in
12 Exhibit 329. Cisco doesn't list it that way. "No"
13 is an optional thing that you can write in front of
14 the command, right?
15 A "No" is an optional extension to add in 15:38:51
16 front of the command.
17 Q And was that already the way the IOS CLI
18 worked before you started working at Cisco?
19 A By my recollection, yes.
20 Q I'd like to turn your attention now to the 15:39:12
21 top four commands in this list, which all begin with
22 the word "show."
23 A Yes.
24 Q The words "show snmp," and then there's
25 another word. 15:39:22

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1 Did you author these commands? 15:39:30
2 A I think it's just a safe assumption that I
3 authored the engineID command.
4 Again, I'm going by the fact that it's
5 semi CamelCase and it looks odd, and I'm not sure 15:39:43
6 anybody else in my team would have come up with
7 that.
8 The rest of the commands -- they may all
9 have been group efforts, team efforts. But I -- I'm
10 pretty sure I checked in the files of these 15:39:58
11 commands.
12 Q Okay. Mr. Kavasseri, you've said a couple
13 times that it may be that you were listed here as
14 the author of the command because you were the
15 person who checked in the files. 15:40:35
16 What do you mean when you say that?
17 A Every Cisco command -- every IOS CLI
18 command is implemented in a source code file. When
19 somebody finished developing that, they checked the
20 command in. 15:41:02
21 So in this case, if you're referring to --
22 by "author," if you mean the person who checked in
23 the files, then yes, these files were all checked in
24 by me originally. But that does not mean that I was
25 the sole creator of these keywords. 15:41:15

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1 We have a very collaborative work 15:41:20
2 environment when I was there, and I -- especially
3 with an important feature like SNMP V3, I would
4 think that this was a team effort
5 Q I just need to go back a second Could 15:41:36
6 you grab Exhibit 336, which is RFC 2271?
7 A Yeah
8 Q Could you turn to page 45 of that exhibit?
9 A Yep
10 Q This is an acknowledgment section which 15:41:52
11 acknowledges the efforts of the SNMP V3 working
12 group at IETF, and it lists as working group members
13 a number of people who work at a variety of
14 different companies
15 A Yes 15:42:04
16 Q Some of those people are Keith McCloghrie,
17 and in parentheses it says, "Cisco Systems"; Bob
18 Stewart, and in parentheses, "Cisco Systems"; and
19 Jeff Johnson in the next section, which is a list of
20 members of an advisory team at the IETF, also at 15:42:19
21 Cisco Systems
22 Did you know all of these people?
23 A Yes, I did
24 Q Do you recall Mr McCloghrie, Mr Stewart
25 and Mr Johnson contributing to the SNMP V3 industry 15:42:35

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| | |
|---|---|
| 1 standard protocol while you were working at Cisco?   15:42:40 | 1    Q  I understand.                        15:45:53 |
| 2    A  I was not in the room for discussions | 2      You've expressed some additional haziness |
| 3 to -- let me rephrase by saying I had very limited | 3 about the command "show snmp host." |
| 4 interactions at the time this document was written. | 4    A  Yes. |
| 5      I know that Jeffrey Johnson was very   15:43:08 | 5    Q  I'm going to apologize in advance for the   15:46:21 |
| 6 involved because he was my mentor, and he would tell | 6 heft of this thing. |
| 7 me that he was working on the RFC draft. I have no | 7    A  Holy cow. |
| 8 direct evidence of the other two that I can recall. | 8      (Exhibit 338 was marked for identification |
| 9      I will add an addendum that they both were | 9      and is attached hereto.) |
| 10 very respected people, and I'm very sure they did a   15:43:32 | 10 BY MR. SANTACANA:                        15:46:31 |
| 11 lot for these documents. I just don't have any | 11    Q  Exhibit 338 is titled "Cisco IOS Network |
| 12 direct evidence that I was privy to from a working | 12 Management Command Reference." It bears control |
| 13 meeting or anything else. | 13 numbers beginning with CSI-CLI-00319765, and it's |
| 14    Q  Okay. So you can set that aside now. | 14 dated October 2009. |
| 15      Looking back at Exhibit 329, we'd started   15:43:57 | 15      I just want you to flip to the page that   15:47:03 |
| 16 discussing the four "show" commands, "show snmp" | 16 ends in 1060. The internal page would be NM-1248. |
| 17 commands. | 17      So this page relates to the command |
| 18      "Show" was a term that was already in | 18 "snmp-server host." |
| 19 IOS CLI; is that fair to say? | 19    A  Yes. |
| 20    A  When I joined Cisco -- I've actually never   15:44:11 | 20    Q  Do you recognize that command?          15:47:58 |
| 21 asked the question when "show" was in the command. | 21    A  Yes, now I do. |
| 22 As far as I can tell, it was there when I joined. | 22    Q  Did you author that command? |
| 23    Q  And the reason that you used it here was | 23    A  I will go back to my earlier statement |
| 24 because it was already used in other IOS CLI | 24 that it's highly likely that I checked in the file |
| 25 commands?                                 15:44:37 | 25 with this command. Especially with this command, I   15:48:21 |
|                                   Page 170 |                                   Page 172 |

| | |
|---|---|
| 1    A  By the time I implemented these commands,   15:44:38 | 1 am not sure whether I was the original author of the   15:48:24 |
| 2 "show" was the standard way to display information | 2 term "host." |
| 3 from the CLI. | 3      I'm going to say "term" instead of |
| 4    Q  And the term "SNMP," of course, as we've | 4 "command," which you used, because we're talking |
| 5 discussed, is an industry standard protocol; is that   15:44:49 | 5 about an extension to the SNMP server command here.   15:48:32 |
| 6 fair to say? | 6      The reason I say "host" is, if I remember |
| 7    A  In which context? The term "SNMP" by | 7 right, the previous version, now that I'm reading |
| 8 itself as an acronym is industry standard protocol, | 8 this, we are specifying the target of an event that |
| 9 yes. | 9 is being messaged through SNMP. |
| 10    Q  And then so the first two words in each of   15:45:07 | 10      Previously this event was called a trap.   15:48:58 |
| 11 these commands is "show snmp." And then we have | 11 Now we're giving you the option of a trap or an |
| 12 "show snmp user" and "show snmp group." | 12 inform. |
| 13    A  Yeah. | 13      So there was some effort to differentiate |
| 14    Q  And the terms "user" and "group" also are | 14 between what was before and what is now the |
| 15 terms that are used in the IETF SNMP documents; is   15:45:21 | 15 acceptable -- accepted way of configuring targets.   15:49:20 |
| 16 that fair to say? | 16    Q  If you look at the page NM-1251, control |
| 17    A  "User" and "group" appear in the -- "snmp | 17 number ends in 1063, this is a command history for |
| 18 user" and "group" appear in the IETF documents. | 18 the command "snmp-server host," and it lists as the |
| 19    Q  And the way that they're used here is the | 19 first release IOS version 10. |
| 20 same way that they're used in those IETF documents?   15:45:35 | 20      Do you see that?                        15:50:04 |
| 21    A  To the best of my knowledge, they refer to | 21    A  "Host"? I thought that that previous |
| 22 the same things. But they're not used in the same | 22 version was "enable trap." Let me double-check. |
| 23 way in that the IETF document does not refer to a | 23 Yeah, this differs from my recollection. |
| 24 CLI command. In here they're used specifically for | 24    Q  Sorry? |
| 25 CLI commands.                             15:45:52 | 25    A  This differs from my recollection.       15:50:29 |
|                                   Page 171 |                                   Page 173 |

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1 dictate whether the SNMP is an industry standard or       16:21:36
2 not?
3           MR. SANTACANA: Same objections.
4           THE WITNESS: I could only offer an
5 opinion on this. And if you would like my opinion,       16:21:45
6 if enough vendors do not implement a particular
7 proposal, I do not believe that proposal should be
8 called a standard.
9           If you can hold for a second, I need to
10 turn the phone off now. Sorry. I turned it on,       16:22:05
11 checking. Sorry. Thank you.
12 BY MR. TUNG:
13      Q Okay. Can we turn to Exhibit 329?
14      A I'm going to have nightmares about this.
15      Q Have you ever done an investigation       16:22:44
16 whether the specific command expressions that appear
17 in Exhibit 329 are used in this exact form in other
18 competitors' CLI?
19      A Can you repeat that question?
20      Q Yeah.       16:23:04
21           Have you ever done an investigation
22 whether these specific command expressions that
23 appear in Exhibit 329 appear in Cisco's competitors'
24 CLI?
25      A I believe I may have gone looking for       16:23:20

**Page 191**

1 these in at least one competitor's CLI.       16:23:21
2      Q And did you determine whether any of these
3 command expressions appeared exactly the same way in
4 the competitor's CLI?
5      A I would prefer to not answer that question       16:23:52
6 because it might impact work product.
7      Q Okay. So let me rephrase the question.
8           So setting aside any work done at the
9 direction of attorneys, have you investigated
10 whether any command expressions that appear in       16:24:10
11 Exhibit 329 appear identically in a Cisco
12 competitor's CLI?
13      A To the best of my recollection, I have not
14 investigated this in any other vendors' products.
15      Q Now expanding the question a little       16:24:31
16 broader, have you investigated whether any of
17 Cisco's CLI command expressions appear in any Cisco
18 competitors' CLI, again, setting aside any work done
19 at the direction of attorneys?
20      A I want to clarify with my previous answer       16:24:49
21 that's setting aside any work product.
22           Can you repeat the second question again?
23      Q The second question, I'm going to say,
24 setting aside any work product, any work done for
25 attorneys, have you investigated whether any of       16:24:59

**Page 192**

1 Cisco's CLI command expressions appear in any of       16:25:03
2 Cisco's competitors' CLI?
3      A Setting aside work product done for other
4 attorneys, I am -- I cannot recall if I ever
5 investigated whether Cisco's CLI expressions       16:25:20
6 appeared in any other competitor's product.
7      Q Okay.
8      A I would also like to make sure I protect
9 myself -- I want to protect myself from perjuring
10 myself here. By saying I cannot recall that does       16:25:41
11 not mean that it did not happen. My memory doesn't
12 bring it up right now.
13           MR. THOMPSON: Don't be concerned. If you
14 don't recall something, that's perfectly fine to say
15 that.       16:25:51
16           THE WITNESS: Okay. All right.
17 BY MR. TUNG:
18      Q And I think that's really the intent of my
19 question, if you recall any instance in which you
20 have investigated whether a Cisco's competitor's CLI       16:25:57
21 was identical to Cisco's CLI.
22      A I have not to the best of my recollection
23 at the moment. Nothing comes to mind.
24           MR. TUNG: I have no further questions.
25           MR. SANTACANA: I don't have any.       16:26:16

**Page 193**

1           THE VIDEO OPERATOR: This is the end of       16:26:19
2 today's deposition of Mr. Ramanathan Kavasseri. We
3 are off the record at 4:26 p.m. The total number of
4 media used was two and it will be retained by
5 Veritext. Thank you.       16:26:28
6           (TIME NOTED: 4:26 p.m.)
7                --o0o--
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25

49 (Pages 190 - 193)

```
 1
 2
 3
 4
 5
 6
 7
 8        I, RAMANATHAN KAVASSERI, do hereby declare
 9  under penalty of perjury that I have read the
10  foregoing transcript; that I have made any
11  corrections as appear noted, in ink, initialed by
12  me, or attached hereto; that my testimony as
13  contained herein, as corrected, is true and correct.
14        EXECUTED this _____ day of _____,
15  2016, at _____, _____.
16        (City)          (State)
17
18
19        _____
20        RAMANATHAN KAVASSERI
21
22
23
24
25
```

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```
 1        I, the undersigned, a Certified Shorthand
 2  Reporter of the State of California, do hereby
 3  certify:
 4        That the foregoing proceedings were taken
 5  before me at the time and place herein set forth;
 6  that any witnesses in the foregoing proceedings,
 7  prior to testifying, were administered an oath; that
 8  a record of the proceedings was made by me using
 9  machine shorthand which was thereafter transcribed
10  under my direction; that the foregoing transcript is
11  a true record of the testimony given.
12        Further, that if the foregoing pertains to
13  the original transcript of a deposition in a Federal
14  Case, before completion of the proceedings, review
15  of the transcript [X] was [ ] was not requested.
16        I further certify I am neither financially
17  interested in the action nor a relative or employee
18  of any attorney or any party to this action.
19        IN WITNESS WHEREOF, I have this date
20  subscribed my name.
21
22  Dated: 3/7/16
23
24        _Carla Soares_
25        CARLA SOARES
         CSR No. 5908
```

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CONFIDENTIAL INFORMATION UNDER THE PROTECTIVE ORDER

1        UNITED STATES DISTRICT COURT

2       NORTHERN DISTRICT OF CALIFORNIA

3          SAN JOSE DIVISION

4

5    CISCO SYSTEMS,        )

6    INC.,                 )

7         Plaintiff,       )

8            vs.           ) No. 5:14-cv-05344-B1F (PSG)

9    ARISTA NETWORKS,      )

10   INC.,                 )

11        Defendant.       )

12   _____

13   CONFIDENTIAL INFORMATION UNDER THE PROTECTIVE ORDER

14

15      VIDEOTAPED DEPOSITION OF ANTHONY J. LI

16             Palo Alto, CA

17         Monday, February 1, 2016

18              Volume I

19

20

21   Reported by: SUSAN F. MAGEE, RPR, CCRR, CLR

22   CSR No. 11661

23   JOB No. 2224600

24

25   PAGES 1-258

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| | |
|---|---|
| 1     UNITED STATES DISTRICT COURT | 1     I N D E X |
| 2     NORTHERN DISTRICT OF CALIFORNIA | 2 |
| 3     SAN JOSE DIVISION | 3 CONFIDENTIAL INFORMATION UNDER THE PROTECTIVE ORDER |
| 4 | 4 VIDEO DEPOSITION OF ANTHONY J LI |
| 5 CISCO SYSTEMS,   ) | 5 Volume I |
| 6 INC ,     ) | 6 EXAMINATION BY         PAGE |
| 7    Plaintiff,  ) | 7 BY MR WONG         9 |
| 8     vs   ) No 5:14-cv-05344-BIF (PSG) | 8 BY MR PAK        191 |
| 9 ARISTA NETWORKS,  ) | 9 |
| 10 INC ,     ) | 10 |
| 11    Defendant   ) | 11 |
| 12 _____ | 12 |
| 13 | 13 |
| 14 | 14 |
| 15     CONFIDENTIAL INFORMATION UNDER THE | 15 |
| 16 PROTECTIVE ORDER VIDEO DEPOSITION OF ANTHONY J LI | 16 |
| 17 taken on behalf of Defendant at WILSON, SONSINI, | 17 |
| 18 GOODRICH & ROSATI, 601 South California Avenue, | 18 |
| 19 Palo Alto, CA 94304, beginning at 9:13 a m and | 19 |
| 20 ending at 4:17 p m on Monday, February 1, 2016, | 20 |
| 21 before Susan F Magee, RPR, CCRR, CLR, Certified | 21 |
| 22 Shorthand Reporter No 11661 | 22 |
| 23 | 23 |
| 24 | 24 |
| 25 | 25 |
| Page 2 | Page 4 |

| | |
|---|---|
| 1 APPEARANCES: | 1     E X H I B I T S |
| 2 | 2 NUMBER      DESCRIPTION      PAGE |
| 3    For the Plaintiff: | 3 |
| 4     QUINN, EMANUEL, URQUHART & SULLIVAN | 4 Exhibit 136   LinkedIn Profile (8 pages)    12 |
| 5     BY: SEAN PAK, ESQ. | 5 Exhibit 137   RFC Table (3 pages)     90 |
| 6     50 California Street | 6 Exhibit 138   March 1995 RFC 1771, A Border   100 |
| 7     22nd Floor | 7     Gateway Protocol 4 (BGP-4) (57 |
| 8     San Francisco, CA 94111 | 8     pages) |
| 9     (415) 875-6600 | 9 Exhibit 139   December 1995 RFC 1887, An   105 |
| 10     seanpak@quinnemanuel.com | 10     Architecture for IPv6 Unicast |
| 11 | 11     Address Allocation, |
| 12    For the Defendant: | 12     ARISTANDCA00025747-ARISTANDCA |
| 13     KEKER & VAN NEST LLP | 13     00025772 |
| 14     BY: RYAN WONG, ESQ. | 14 Exhibit 140   June 1996 RFC 1966, BGP Route   111 |
| 15      BRIAN L. FERRALL, ESQ. | 15     Reflection, An Alternative to |
| 16     633 Battery Street | 16     Full Mesh IBGP, |
| 17     San Francisco, CA 94111-1809 | 17     ARISTANDCA00025927-ARISTANDCA |
| 18     (415) 773-6682 | 18     00025933 |
| 19     rwong@kvn.com | 19 Exhibit 141   October 2008 RFC 2966,     116 |
| 20     bferrall@kvn.com | 20     Domain-Wide Prefix Distribution |
| 21 | 21     with Two-Level IS-IS (16 pages) |
| 22    The Videographer: | 22 Exhibit 142   August 1996 RFC 1997, BGP    119 |
| 23     JEFREE ANDERSON | 23     Communities Attribute, |
| 24 | 24     ARISTANDCA00026094-ARISTANDCA |
| 25 | 25     00026098 |
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CONFIDENTIAL INFORMATION UNDER THE PROTECTIVE ORDER

1   Palo Alto, CA, Monday February 1, 2016
2           9:13 a.m.
3
4       THE VIDEOGRAPHER:  Good morning.  We're on
5   the record at 9:13 a.m. on February 1st, 2016.  This   09:13:47
6   is the video recorded deposition of -- so sorry.  Of
7   Anthony Li here with our court reporter Susan Magee.
8       My name is Jefree Anderson.  We are here
9   from Veritext Legal Solutions at the request of
10  counsel for the -- defendant or the plaintiff?       09:14:16
11      MR. WONG:  Defendants.
12      THE VIDEOGRAPHER:  For the defendant.  This
13  deposition is being held at Wilson Sonsini at
14  601 California Avenue, Palo Alto, California.  The
15  caption of this case is Cisco Systems, Incorporated   09:14:31
16  vs. Arista Networks, Incorporated.  The case number
17  is 5:14-cv-05344.
18      Please note that audio and video recording
19  will take place unless all parties agree to go off
20  the record, and microphones are sensitive and may     09:14:53
21  pick up whispers, private conversations and cellular
22  interference; so please be aware of that.
23      Beginning with our noticing attorney,
24  please state your name and the firm you represent.
25      MR. WONG:  Ryan Wong from Keker & Van Nest   09:15:05

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1  for defendant Arista Networks.
2       MR. FERRALL:  Brian Ferrall, Keker & Van
3  Nest, also for Arista.
4       MR. PAK:  Sean Pak of Quinn for Cisco.
5       THE VIDEOGRAPHER:  Thank you.               09:15:16
6       Will the court reporter please swear in the
7  witness.
8
9           ANTHONY J. LI,
10  having been administered an oath, was examined and    09:15:19
11  testified as follows:
12
13          EXAMINATION BY MR. WONG
14
15  Q.  Good morning, Mr. Li.                  09:15:29
16  A.  Good morning.
17  Q.  Please state your full name.
18  A.  Anthony Joseph Li.
19  Q.  Do you live in the Bay Area, Mr. Li?
20  A.  I do.                             09:15:36
21  ███  ██████████████████████████
22  ███  ██████████████████████████
23  ███████
24  Q.  Mr. Li, do you understand that are you
25  testifying here in response to a subpoena in this    09:15:46

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3 (Pages 6 - 9)

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CONFIDENTIAL INFORMATION UNDER THE PROTECTIVE ORDER

1 lawsuit?
2    A. I do.
3    Q. Have you seen the subpoena in the lawsuit?
4    A. Yes, I have.
5    Q. Mr. Li, are you represented by an attorney    09:15:55
6 at this deposition?
7    A. No, I am not.
8    Q. Have you been deposed before, Mr. Li?
9    A. Yes, I have.
10    Q. Okay. I'm just going to go over some of    09:16:03
11 the ground rules of a deposition just to refresh how
12 this goes.
13       Mr. Li, do you understand that you are
14 testifying under oath under penalty of perjury?
15    A. I do.    09:16:14
16    Q. Do you understand that the testimony that
17 you are providing today is as if you were testifying
18 in court?
19    A. I do.
20    Q. The court reporter is writing down    09:16:21
21 everything that we say, so it's important to give
22 verbal answers to my questions.
23       Do you understand?
24    A. I do.
25    Q. It's also important that we don't speak    09:16:29

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1 over each other. So I'll do my best to let you
2 finish your answers before I ask the next question
3 and I would ask that you let me finish my next
4 question before you begin your answer.
5       Is that clear?    09:16:41
6    A. Yes.
7    Q. If there is a question that I ask that you
8 don't understand, please let me know, and I'll try
9 to clarify it, okay?
10    A. Okay.    09:16:48
11    Q. Otherwise, if you answer my question, I'll
12 assume that you understood my question.
13    A. Okay.
14    Q. Okay. Is there any reason, Mr. Li, that
15 you can't give full and truthful testimony today?    09:16:57
16    A. No.
17    Q. Mr. Li, I know you're not represented by
18 counsel today. If there is any answer that you
19 provide today that you would like to request to
20 designate confidential under the protective order in    09:17:09
21 this case, please state that on the record.
22    A. Okay.
23       MR. PAK: Mr. Li, I'll also add that, on
24 behalf of Cisco, I'll be making some objections from
25 time to time just to preserve the record. And    09:17:21

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1 obviously if anything that's confidential to Cisco,
2 I will be designating that as confidential under the
3 protective order.
4       THE WITNESS: Okay.
5       BY MR. WONG: Q. And I will be taking    09:17:31
6 breaks during the day, Mr. Li. I'll try to take a
7 break about every hour.
8       But if you would like to take a break for
9 any reason, just let me know, and I will try to
10 accommodate that, okay?    09:17:40
11    A. Thank you.
12    Q. Mr. Li, do you maintain a profile on the
13 Web site called LinkedIn?
14    A. I do.
15       MR. WONG: Let's mark this as Exhibit 136,    09:18:01
16 please.
17       (Exhibit 136 was marked for identification
18 by the court reporter and is attached hereto.)
19       BY MR. WONG: Q. Court reporter has marked
20 Exhibit 136.    09:18:19
21       Mr. Li, do you have Exhibit 136 in front of
22 you?
23    A. I do.
24    Q. Okay. Do you recognize Exhibit 136?
25    A. This appears to be my profile for LinkedIn.    09:18:25

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1    Q. Can you please take a moment to look at
2 Exhibit 136 and let me know if the information is
3 up-to-date and accurate.
4    A. It is accurate. It is reasonably
5 up-to-date, but it is not complete.    09:18:48
6    Q. What is incomplete about the information on
7 Exhibit 136?
8    A. In particular, it is not a complete list of
9 patents and publications.
10    Q. Is there anything else that is incomplete    09:19:01
11 about Exhibit 136?
12    A. I don't believe -- you know, my work
13 history here only goes back to '91.
14    Q. Anything else, Mr. Li?
15    A. No.    09:19:21
16    Q. What is your educational background,
17 Mr. Li?
18    A. I have a B.S. in mathematics from
19 Harvey Mudd College and a Ph.D. in computer science
20 from USC.    09:19:39
21    Q. When did you receive your B.S. in
22 mathematics from Harvey Mudd?
23    A. '82.
24    Q. And when did you receive your Ph.D. from
25 USC?    09:19:49

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4 (Pages 10 - 13)

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CONFIDENTIAL INFORMATION UNDER THE PROTECTIVE ORDER

| | |
|---|---|
| 1   A. 1990. | 1   A. EGP is a routing protocol that allows |
| 2   Q. And the USC you're referring to, that's the | 2   individual hosts to advertise routing prefixes to |
| 3   University of Southern California; correct? | 3   the gateways of the then ARPANET or MILNET. |
| 4   A. Correct. | 4   Q. Is EGP a standardized routing protocol? |
| 5   Q. Do you have any other degrees besides the   09:19:58 | 5   A. Yes, it is.                 09:23:29 |
| 6   bachelor's degree and your Ph.D.? | 6   Q. How do you know that? |
| 7   A. No. | 7   A. I've read the RFC. |
| 8   Q. Your LinkedIn profile marked as Exhibit 136 | 8   Q. What is an RFC, Mr. Li? |
| 9   states that you attended Rutgers University; is that | 9   A. It as a Request For Comments that is a |
| 10  correct?                 09:20:20 | 10  document from the Internet Engineering Task Force,   09:23:41 |
| 11  A. I spent one year at Rutgers. Did not get a | 11  IETF, that they use for standardizing protocols. |
| 12  degree there. | 12  I'm unaware of the exact standards placement of -- |
| 13  Q. Was your focus at the University of | 13  or progression of EGP at this time. It's probably |
| 14  Southern California on anything in particular? | 14  moved to historic by now. |
| 15  A. I was working on a Ph.D. in computer     09:20:31 | 15  Q. When you say it's "moved to historic by     09:24:01 |
| 16  science in the programming languages area. | 16  now," what do you mean by that? |
| 17  Q. What programming languages were you working | 17  A. So the IETF has a progression for |
| 18  on. | 18  standards, and standards that are no longer actively |
| 19  A. So it was not a specific language. It was | 19  used or recommended are moved to historic to |
| 20  in language theory, and in particular I was working   09:20:47 | 20  indicate that they are no longer productive.     09:24:19 |
| 21  on compiler specifications. | 21  Q. You also mentioned IGRP. Can you describe |
| 22  Q. What routing protocols, if any, did you | 22  to me what IGRP is. |
| 23  learn about as part of obtaining your Ph.D. at USC? | 23  A. IGRP is Cisco's proprietary classful |
| 24  A. None; however, as a postdoc at USC, I | 24  protocol. |
| 25  actually worked on IDPR, Inter-Domain Policy     09:21:13 | 25  Q. When you say Cisco proprietary, what do you   09:24:40 |
| Page 14 | Page 16 |
| 1   Routing. | 1   mean by that? |
| 2   Q. Inter-Domain Policy Routing? | 2   A. Cisco owns the code, has a patent on the -- |
| 3   A. Correct. Also, while I was assist admin at | 3   or on the concepts behind the implementation, and as |
| 4   USC, I was a network administrator, so I had | 4   far as I know, has not licensed it with the |
| 5   familiarity there with EGP and IGRP.       09:21:41 | 5   exception of licensing their whole source code     09:24:58 |
| 6   Q. What is EGP? | 6   stack. |
| 7   A. Exterior Gateway Protocol. | 7   Q. How did you work with EGP while you were a |
| 8   Q. And what is IGRP? | 8   sys admin? |
| 9   A. Interior Gateway Routing Protocol. | 9   A. So I was responsible for maintaining EGP |
| 10  Q. You mentioned IDPR as part of your postdoc   09:22:06 | 10  connectivity between USC's site and the ARPANET core  09:25:11 |
| 11  work; correct? | 11  gateways. |
| 12  A. Correct. | 12  Q. And what was your experience as a sys admin |
| 13  Q. Can you describe for me how you worked with | 13  working with IGRP? |
| 14  IDPR in your postdoc work at USC. | 14  A. So I was maintaining the Los Nettos Network |
| 15  A. So I was working for Deborah Estrin, and     09:22:24 | 15  which was a small regional network in Los Angeles.   09:25:24 |
| 16  she was collaborating with Martha Steenstrup of | 16  We used IGRP for routing between the sites and our |
| 17  Bolt, Beranek & Newman in Boston. They was a -- | 17  small network. |
| 18  they had some sort of research contract to develop a | 18  Q. And what period of time were you a sys |
| 19  routing protocol that supported policy routing. | 19  admin for USC? |
| 20  Q. Was IDPR a proprietary standard?       09:22:43 | 20  A. Approximately 1983 through 1990.         09:25:36 |
| 21  A. I have no idea. | 21  Q. Besides IDPR, EGP and IGRP, did you work |
| 22  Q. You said you worked at -- you worked on EGP | 22  with any other routing protocols while you were |
| 23  while as a sys admin at USC; is that correct? | 23  either obtaining your Ph.D. or serving as a postdoc? |
| 24  A. That's correct. | 24  A. Probably. So I do not recall the details, |
| 25  Q. What is EGP?                 09:23:07 | 25  but I do know that we had also a DECnet network, and  09:26:12 |
| Page 15 | Page 17 |

5 (Pages 14 - 17)

CONFIDENTIAL INFORMATION UNDER THE PROTECTIVE ORDER

1 I believe that DECnet routing was involved, and that
2 is a -- uses an internal routing protocol that is
3 very simple -- similar to RIP.
4    Q. Now, you said DECnet. What is DECnet?
5    A. DECnet was a proprietary networking stack    09:26:36
6 from Digital Equipment Corporation.
7    Q. So the DEC in DECnet stands for
8 Digital Equipment Corporation?
9    A. Yes.
10    Q. When you say "we also had a DECnet    09:26:56
11 network," who is "we"?
12    A. I was referring to my employers at USC, in
13 particular engineering computer services which then
14 became university computing services.
15    Q. What experience did you have working with    09:27:20
16 the DECnet network at USC?
17    A. Mostly it was frustrating. The DECnet
18 network was interconnecting the router -- the
19 various hosts around the campus, allowing students
20 and faculty to move data around between the various    09:27:36
21 computers.
22    Q. What was the operating system like on the
23 DECnet network?
24    A. So we had multiple systems speaking DECnet.
25 There were many VAXes running the VMS operating    09:27:54
Page 18

1    A. I do.
2    Q. What is a command line interface?
3    A. A command line interface is a means for a
4 user to enter commands typing out names of words and
5 then interacting with a computer by having the    09:29:50
6 computer respond to those words.
7    Q. If I use the term "CLI," will you
8 understand that I'm referring to a command line
9 interface?
10    A. I understand.    09:30:06
11    Q. Did the VAX/VMS operating system have a
12 command line interface?
13    A. It did.
14    Q. Can you describe for me generally how the
15 VAX/VMS command line interface worked.    09:30:17
16    A. It was a very standard command-and-response
17 interface. Predominant were set and show. Change
18 parameters and then display parameters.
19    Q. When you say "very standard
20 command-and-response interface," what do you mean by    09:30:39
21 "very standard"?
22    A. So very similar to other things in the
23 industry.
24    Q. At that time?
25    A. Yes.    09:30:50
Page 20

1 system. We also had several systems running
2 TOPS-20.
3    Q. You said VAX/VMS. Does that stand for
4 anything?
5    A. VAX is virtual address extension. VMS is    09:28:15
6 virtual memory system.
7    Q. How much experience did you have working
8 with the VAX/VMS operating system?
9    A. I was a system administrator for several
10 years while at USC.    09:28:36
11    Q. And how many years of experience did you
12 have working with the TOPS-20 operating system?
13    A. I was only a user of TOPS-20. I got my
14 first TOPS-20 account in 1982. I probably used
15 that -- well, at least eight years, so . . .    09:29:03
16    Q. So as a user, you used TOPS-20 for
17 approximately eight years?
18    A. Yes.
19    Q. And approximately how many years did you
20 work as a system administer [sic] for the VAX/VMS    09:29:17
21 operating system?
22    A. I'm not certain. I believe it was
23 approximately 1983 through about 1987.
24    Q. Mr. Li, do you know what a command line
25 interface is?    09:29:40
Page 19

1    Q. And approximately what time period are we
2 talking about, Mr. Li?
3    A. The first time I saw VMS was '81.
4    Q. You mentioned that set and show commands
5 were predominant in VAX/VMS; correct?    09:31:13
6    A. Mm-hmm.
7    Q. Were there any other commands that you
8 recall from using the VAX/VMS command line
9 interface?
10    A. There were many other commands, and you    09:31:25
11 could easily extend it by adding additional commands
12 to it, so . . .
13    Q. How would you extend it by adding
14 additional commands to it?
15    A. So the entire operating system CLI was    09:31:39
16 built around what was called DCL, digital command
17 language. You so actually write command definitions
18 and add those to the CLI.
19    Q. Were you familiar with digital command
20 language at the time?    09:32:00
21    A. Slightly.
22    Q. Did the show commands in VAX/VMS follow any
23 particular syntax?
24    A. Yes. They typically were invoked by show
25 and then usually an object name and then a set of    09:32:16
Page 21

6 (Pages 18 - 21)

1 parameters. The parameters were delineated by a
2 slash and then parameter name. Sometimes there was
3 a value attached with an equal sign and then a value
4 attached to a given parameter. The set commands
5 were pretty much the same way.                    09:32:39
6     Q. Now, you said, "typically were invoked" was
7 part of your answer about how show commands worked.
8        Were there any exceptions to the syntax you
9 just described?
10     A. Well, that was very much a generalization,    09:32:58
11 so yes.
12     Q. What was the command syntax like for
13 TOPS-20?
14     A. TOPS-20 had a command syntax that was
15 somewhat similar to VMS. The notable difference was  09:33:22
16 that TOPS-20 allowed for a command completion, and
17 so you could use escape and tab and question mark
18 characters to interact directly with the command
19 line interpreter while you were typing a command
20 line.                                        09:33:42
21     Q. What type -- what time period are you
22 talking about here, Mr. Li?
23     A. I am unaware of when TOPS-20 first came
24 out.
25     Q. At what time period were you working with    09:33:54

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1 feature while you were working with TOPS-20?
2     A. Yes.
3     Q. Is the recollection you just described
4 based upon your hands-on experience with TOPS-20?
5     A. Yes, it is.                            09:35:27
6     Q. Now, you said TOPS-20 had a similar syntax
7 to VMS.
8        What was similar about the TOPS-20 command
9 syntax to the VAX/VMA command syntax?
10     A. Again, the general intent of -- or design    09:35:58
11 of the -- in the language was an imperative language
12 where they would design it as verb and then noun,
13 noun. So you would give the command as SHO and then
14 some parameters to go with it.
15        The details of the syntax were definitely    09:36:23
16 different. TOPS-20 in particular never used a slash
17 as a parameter separator.
18     Q. Now, you've used the word "parameter" to
19 describe the syntax for both VAX/VMS and TOPS-20?
20     A. Mm-hmm.                              09:36:46
21     Q. What do you mean by a parameter?
22     A. It's a qualifier or other conditional
23 information about the specific request.
24     Q. Can you give me an example of what would be
25 a command parameter?                        09:36:56

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1 TOPS-20?
2     A. Again, I got my first TOPS-20 account in
3 1982.
4     Q. Okay. So these features you just
5 described, command completion, were those in TOPS-20   09:34:05
6 when you first got your account in 1982?
7     A. Yes.
8     Q. What is command completion?
9     A. Command completion is the ability for the
10 command line interpreter to infer from what the user   09:34:25
11 has typed as a partial command and then actually
12 have it type out the rest of the command for the
13 user.
14     Q. Can you give me an example of how command
15 completion would work in a TOPS-20 command line       09:34:41
16 interface.
17     A. Oh, dear. So not accurately.
18 Approximately, you would type a partial command. So
19 for example, if you were to type "SHO," S-H-O, and
20 then complete it, you would get the W and then a      09:34:58
21 space, so you could then enter a parameter.
22        MR. PAK: I'm going to object that this
23 calls for expert testimony. Speculation.
24        BY MR. WONG: Q. Mr. Li, did you use the
25 command -- did you use the command completion         09:35:17

Page 23

1     A. For example, if the database of files had a
2 set of file names, you could give a directory
3 command which would show the files in the directory.
4 Then you could also give directory followed by a
5 parameter which would explain -- which would specify   09:37:17
6 some subset of the files that you would like to see.
7     Q. Besides VAX/VMS and TOPS-20, did you have
8 experience with any other command line interfaces?
9     A. Many.
10     Q. Okay. What other command line interfaces    09:37:43
11 do you have experience with, Mr. Li?
12     A. That could take a while. CPM, VMCMS.
13 Let's see. Concurrent CPM, MS-DOS, RSX-11M.
14 Probably many others.
15     Q. Which of those existed prior to 1985?       09:38:15
16     A. All of those.
17     Q. Did any of those exist prior to 1980?
18     A. Yes, very definitely. Let's see. UNIX
19 already existed. There was a CLI there. I believe
20 that CPM predates 1980.                        09:38:38
21     Q. And did you work directly with all of the
22 command line interfaces that you just recited?
23     A. Yes.
24     Q. In what capacity did you work with those
25 command line interfaces?                        09:39:02

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7 (Pages 22 - 25)

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| | |
|---|---|
| 1 A. That varies. I was a programmer at | 1 accessible to the system administrator. |
| 2 Digital Research working on CPM, so I was a | 2 Q. When you say "privileged," what do you mean |
| 3 developer in that role. Most of the others I was a | 3 by that? |
| 4 user. | 4 A. The system administration and management |
| 5 Q. When were you a programmer at 09:39:12 | 5 commands are -- cannot be executed by a normal user. 09:42:46 |
| 6 Digital Research? | 6 Q. Were there similar separations of command |
| 7 A. So I had two summer internships, the | 7 sets in any of the other operating systems that we |
| 8 summers of 1982 and 1981. | 8 discussed this morning? |
| 9 Q. What was the command -- strike that. | 9 A. Almost all have that kind of separation. |
| 10 Actually, what was the command syntax used 09:39:34 | 10 Q. What -- describe for me the separation in 09:43:08 |
| 11 for CPM? | 11 command sets that existed in TOPS-20. |
| 12 A. Again, it was very similar to use -- what | 12 A. As a user of TOPS-20, I don't recall the |
| 13 was used in TOPS-20 and VMS. Again, verb, noun and | 13 details of the administration commands, so I never |
| 14 qualifiers. | 14 used them. |
| 15 Q. What were some of the verbs that were used 09:39:52 | 15 Q. Were the administration commands in TOPS-20 09:43:25 |
| 16 in the command set for CPM? | 16 accessible to you as a user? |
| 17 A. I'm sorry. I've forgotten. | 17 A. No. |
| 18 Q. Do you recall any of the verbs that were | 18 Q. How were command sets separated in VAX/VMS? |
| 19 used in the command sets for TOPS-20? | 19 A. Again, there were privileged commands that |
| 20 A. Info, show, DIR. I've forgotten most of 09:40:07 | 20 one could use if you were a system administrator. 09:43:46 |
| 21 the others. | 21 Q. Was the term "privileged" a term that you |
| 22 Q. You mentioned MS-DOS as one of the command | 22 came up with, Mr. Li? |
| 23 line interfaces that you had worked with; correct? | 23 A. No. I'm sure that several of -- I've |
| 24 A. Mm-hmm. | 24 picked that up somewhere, but that is commonly used. |
| 25 Q. In what context did you work with MS-DOS? 09:40:30 | 25 Q. That is commonly used to describe what? 09:44:14 |
| Page 26 | Page 28 |

| | |
|---|---|
| 1 A. Just as a user. | 1 A. Throughout the industry to indicate that |
| 2 Q. And that was in the early 1980s? | 2 people -- certain administrators have abilities that |
| 3 A. At some point, yes. | 3 are past normal users. |
| 4 Q. You also mentioned UNIX as a system that | 4 Q. Was the term "privileged" commonly used at |
| 5 you have experience with; correct? 09:40:54 | 5 the time that you were working on VAX/VMS? 09:44:30 |
| 6 A. That's correct. | 6 MR. PAK: Objection. Calls for expert |
| 7 Q. In what context did you work with the UNIX | 7 testimony. |
| 8 operating system? | 8 BY MR. WONG: Q. Just to your |
| 9 A. I had access to a UNIX system as a user | 9 recollection, Mr. Li. |
| 10 starting in 1975. 09:41:03 | 10 A. Yes. 09:44:40 |
| 11 Q. Do you know how long UNIX has been in | 11 Q. And what facts are you basing that answer |
| 12 existence as an operating system? | 12 on? |
| 13 A. No, I don't. | 13 A. I was a system administrator for a VMS |
| 14 Q. And how many years did you work with the | 14 system. |
| 15 UNIX operating system? 09:41:22 | 15 Q. Did you use the term "privileged" to 09:44:50 |
| 16 A. I've been working with it on and off since | 16 describe commands that were accessible only to |
| 17 1975. | 17 system administrators at the time you were working |
| 18 Q. Can you describe for me how the UNIX CLI | 18 on VAX/VMS? |
| 19 worked? | 19 A. Probably. |
| 20 A. UNIX CLI is, again, a command and 09:42:06 | 20 Q. Was it likely that you were using that 09:45:03 |
| 21 parameters structure with a verb and then nouns and | 21 term? |
| 22 qualifiers behind it. | 22 A. Very likely. |
| 23 Q. Were all commands available to a UNIX user? | 23 Q. You mentioned VMCMS. What experience did |
| 24 A. There are commands that are not available | 24 you have working with VMCMS? |
| 25 that they are -- they're privileged and only 09:42:33 | 25 A. So USC maintained, in addition to numerous 09:45:27 |
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1 DEC systems, also had several IBM systems. VMCMS is
2 an operating system for IBM mainframes, and USC had
3 one and I had an account on the VM system.
4    Q. And what was the command syntax like for
5 the CLI on VMCMS?                    09:45:55
6    A. I'm sorry. I don't remember.
7    Q. You mentioned RSX-IIM?
8    A. It's 11M.
9    Q. 11M. Sorry.
10    A. This was an operating system for PDP-11s.    09:46:06
11    Q. What are PDP-11s?
12    A. That was a computer built by
13 Digital Equipment Corporation.
14    Q. Do you recall the command syntax of the
15 command line interface used on the RSX-11M?    09:46:25
16    A. No, I'm sorry. I don't.
17    Q. You mentioned that the LinkedIn profile
18 that we marked as Exhibit 136 did not have your full
19 work history?
20    A. Correct.                    09:46:46
21    Q. What work history is missing from your
22 LinkedIn profile?
23    A. In particular the sys admin positions that
24 I mentioned, summer internships predating. There
25 were several of those. Full-time positions that are    09:46:59

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1 not relevant to my professional experience,
2 particularly while I was in high school.
3    Q. Sure. After you graduated from USC, what
4 did you do then?
5    A. So I -- next fall I went to Rutgers and    09:47:20
6 spent a year there, hated it and immediately
7 transferred to USC.
8    Q. Oh, I'm sorry. My question was after you
9 graduated from USC, what did you do after that?
10    A. After USC? So I graduated in September    09:47:38
11 of 1990. I worked on a postdoc at USC with
12 Deborah Estrin and then took a position at
13 Cisco Systems.
14    Q. Do you know when you started at
15 Cisco Systems?                    09:47:53
16    A. January 14th, 1991.
17    Q. Why did you join Cisco after graduating
18 from USC?
19    A. Lack of a better job.
20    Q. Did you apply elsewhere besides Cisco?    09:48:02
21    A. I did.
22    Q. And describe for me the projects that you
23 worked on while you worked at Cisco starting in
24 1991.
25    A. I worked on a wide, wide variety of    09:48:22

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1 projects throughout the router. I started off doing
2 mostly maintenance work and answering customer
3 questions. I then had several development projects.
4 My first development project was implementing
5 something called TCP header compression.    09:48:41
6    Q. And after you worked on TCP header
7 compression, what else did you work on while at
8 Cisco?
9    A. I had numerous routing -- small projects
10 within routing extending various interfaces and    09:48:58
11 extending protocols as necessary.
12    My next big project was actually working on
13 BGP, Border Gateway Protocol.
14    BY MR. WONG: Q. You mentioned TCP header
15 expression. What does TCP mean?    09:49:22
16    A. That's Transmission Control Protocol. It's
17 part of the Internet Protocol suite.
18    Q. Is TCP an industry standard?
19    A. It is.
20    Q. Was it an industry standard at the time you    09:49:37
21 worked on it at Cisco?
22    A. It was.
23    Q. What standard-setting body produced the TCP
24 standard?
25    A. That's a difficult question. The TCP    09:49:49

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1 standard was really a product of -- I guess the
2 ARPANET project, but this actually predates IETF
3 being accepted as a standards-making body, which is
4 a whole book in itself. Great deal of politics
5 behind that. So it was a de facto standard    09:50:16
6 effectively.
7    Q. What do you mean by "de facto standard"?
8    A. Which meant that the industry used it and
9 it was publicly available, everyone was free to
10 adopt it, and yet it did not have the backing of a    09:50:36
11 formal standards body such as the IEEE.
12    MR. PAK: I'll object to this line of
13 questioning as calling for expert testimony.
14    BY MR. WONG: Q. Now, you said that the
15 TCP standard was really a product of ARPANET;    09:51:10
16 correct?
17    A. Correct.
18    Q. What is ARPANET?
19    A. ARPANET was a project from the Defense
20 Department's Advanced Research Projects Agency to    09:51:18
21 build a network for computers that was highly robust
22 and relayed data between computers efficiently.
23    Q. How do you know that, Mr. Li?
24    A. Having worked on it for many, many years
25 and been involved with it as soon as it became    09:51:34

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1  available to USC and Rutgers.
2      Q. And by "it," you mean ARPANET?
3      A. ARPANET.
4      Q. You mentioned that TCP was part of an
5  Internet Protocol suite. Is that what you said?     09:51:47
6      A. Correct.
7      Q. Were there any other protocols that were
8  part of the Internet Protocol suite?
9      A. Many.
10     Q. Can you list off for me the protocols that   09:51:55
11 you remember being part of the Internet Protocol
12 suite.
13     A. I'll give you a small set. HTTP; BGP; RIP,
14 R-I-P; DNS; DHCP. I could go on, but Susan's
15 fingers are going to fall off.     09:52:17
16     Q. You mentioned HTTP.
17        Is HTTP an industry standard?
18     A. It is.
19     Q. How do you know that?
20     A. There is an RFC on it. I don't know what   09:52:31
21 its exact standard status is but I believe it's at
22 least proposed standard.
23     Q. And how long has HTTP been an industry
24 standard, to your knowledge?
25        MR. PAK: Calls for expert testimony.   09:52:49

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1      A. IETF.
2      Q. What does HTTP stand for?
3      A. Hypertext Transfer Protocol.
4      Q. You mentioned RIP; correct?
5      A. Correct.     09:54:18
6      Q. What does -- is that -- is that called RIP
7  by the industry?
8      A. Normally pronounced that way, yes.
9      Q. What does RIP stand for?
10     A. Routing Information Protocol.     09:54:27
11     Q. Routing Information Protocol is also part
12 of the Internet Protocol suite you mentioned?
13     A. It is.
14     Q. Is Routing Information Protocol an industry
15 standard?     09:54:43
16     A. Yes, it is.
17     Q. How long has Routing Information Protocol
18 been an industry standard?
19     A. I don't know when the RFC came out.
20     Q. And what is the standard-setting body that   09:54:56
21 manages the RIP protocol?
22     A. IETF.
23     Q. You mentioned DHCP?
24     A. Correct.
25     Q. What does DHCP stand for?     09:55:09

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1        THE WITNESS: Approximately 1992.
2        BY MR. WONG: Q. And how do you know that,
3  Mr. Li?
4      A. I first used a Web browser about that time,
5  and had some involvement in developing a Web server   09:53:02
6  for the Cisco router.
7      Q. You mentioned BGP?
8      A. Correct.
9      Q. What does BGP stand for?
10     A. Border Gateway Protocol.     09:53:23
11     Q. And BGP was part of the Internet Protocol
12 suite?
13     A. Yes, it was.
14     Q. Was BGP also an industry standard?
15     A. It is.     09:53:33
16     Q. And how do you know that, Mr. Li?
17     A. I helped write the latest RFC on that.
18     Q. How long has BGP been an industry standard,
19 to your knowledge?
20     A. BGP?     09:53:48
21     Q. BGP.
22     A. BGP has been an industry standard since
23 approximately 1993.
24     Q. And what is the standard-setting body that
25 established BGP as an industry standard?     09:54:02

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1      A. Dynamic Host Configuration Protocol.
2      Q. And is DHCP also an industry standard?
3      A. It is.
4      Q. How do you know that, Mr. Li?
5      A. I've read the RFC.     09:55:21
6      Q. What is the standard-setting body that
7  manages DHCP?
8      A. The IETF.
9      Q. How long has DHCP been an industry
10 standard, to your knowledge?     09:55:42
11     A. Since the early '90s.
12     Q. And how do you know that, Mr. Li?
13     A. He read the RFC.
14     Q. Back in the early '90s?
15     A. Yes.     09:55:51
16     Q. Why were you -- strike that.
17        Besides HTTP, BGP, RIP and DHCP, are there
18 any other well-known protocols that are part of the
19 Internet Protocol suite?
20     A. Many.     09:56:13
21     Q. Can you list for me a few more well-known
22 protocols from the Internet Protocol suite?
23     A. Well, the base protocol is IP, Internet
24 Protocol. On top of that we have DNS, the Domain
25 Name System. There's the File Transfer Protocol,   09:56:40

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10 (Pages 34 - 37)

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| | |
|---|---|
| 1 FTP; the Simple Mail Transfer Protocol, SMTP; Post | 1 connection collisions. |
| 2 Office Protocol, POP; IMAP which is another mail | 2 MR. PAK: At this point I'd like to mark |
| 3 protocol. | 3 this deposition transcript as confidential |
| 4 Q. And the protocols you just mentioned, are | 4 information under the protective order. |
| 5 all of them industry standards, to your knowledge? 09:57:04 | 5 BY MR. WONG: Q. And approximately what 09:59:38 |
| 6 A. They are. | 6 time period did you work on this starter project on |
| 7 Q. What standard-setting body manages the | 7 BGP? |
| 8 Internet Protocol? | 8 A. Approximately 1992. |
| 9 A. Internet Engineering Task Force. | 9 Q. What were you upgrading from BGP Version 2 |
| 10 Q. And what standard-setting body manages the 09:57:17 | 10 to BGP Version 3? 09:59:57 |
| 11 DNS protocol? | 11 A. So the internal implementation of BGP |
| 12 A. IETF. | 12 required a change. The version number required |
| 13 Q. Is the IETF the standard-setting body for | 13 changing. |
| 14 each of the protocols you just mentioned? | 14 Q. When you say "internal implementation," |
| 15 A. Yes. 09:57:31 | 15 what do you mean by that? 10:00:14 |
| 16 Q. We just went through several acronyms for | 16 A. The code that actually performs the |
| 17 different industry standard protocols; correct? | 17 functions inside the router. |
| 18 A. Yes. | 18 Q. And describe for me generally what is the |
| 19 Q. Was "HTTP" a well-known term used in the | 19 function of a router? |
| 20 networking industry at the time that you first 09:58:00 | 20 A. Its purpose is to receive packets and 10:00:34 |
| 21 started working with it? | 21 decide where they should go and then send them out |
| 22 A. No, it was not well-known. | 22 to the best interface in the network. |
| 23 Q. When did you start working with HTTP again? | 23 Q. When you say the word "interface," what do |
| 24 A. Very early '90s. Probably '92, '93 time | 24 you mean by "interface"? |
| 25 frame. 09:58:17 | 25 A. That is the connection of the router to 10:00:58 |
| Page 38 | Page 40 |
| 1 Q. Did HTTP ever become a well-known acronym | 1 another router via a link of some flavor. |
| 2 in the industry? | 2 Communications channel. |
| 3 A. Yes. It's very well-known. | 3 Q. Was "router" a commonly used term at the |
| 4 Q. It's very well-known today? | 4 time that you were working on this BGP project for |
| 5 A. Today. 09:58:27 | 5 Cisco? 10:01:17 |
| 6 Q. Do you approximately when HTTP became a | 6 A. It was. It's also known as a gateway in |
| 7 well-known acronym, to your knowledge? | 7 some circumstances. |
| 8 MR. PAK: Objection. Calls for expert | 8 Q. Were there any particular routers that your |
| 9 testimony. | 9 project applied to? |
| 10 THE WITNESS: Approximately 1995. 09:58:33 | 10 A. In particular it applied to the Cisco AGS 10:01:42 |
| 11 BY MR. WONG: Q. Why do you say 1995, | 11 Plus and the remainder of Cisco's product line at |
| 12 Mr. Li? | 12 the time. |
| 13 A. That's when most people started using the | 13 Q. After you worked on this BGP project, what |
| 14 Web. | 14 else did you do at Cisco? |
| 15 Q. Let's go back to your description of 09:58:40 | 15 A. I've worked on many different things. The 10:02:10 |
| 16 responsibilities when you were working at Cisco | 16 silicon switch engine, various other routing |
| 17 starting in 1991. | 17 protocol maintenance tasks, the router called GSR. |
| 18 The last thing you mentioned was that you | 18 Q. And just to be clear, Mr. Li, are we |
| 19 started working on a BGP project; correct? | 19 talking about the time period where you first |
| 20 A. Correct. 09:59:07 | 20 started working at Cisco in 1991? 10:02:37 |
| 21 Q. Describe for me what that BGP project | 21 A. That was just the '91 through '96 time |
| 22 entailed. | 22 frame. |
| 23 A. So my starter project on BGP was to upgrade | 23 Q. Now, you mentioned performing various other |
| 24 it from BGP Version 2 to Version 3 of the protocol. | 24 routing protocol maintenance tasks. |
| 25 This involved adding a small mechanism for resolving 09:59:21 | 25 What other routing protocols did you work 10:02:54 |
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1 with during this 1991 through 1996 time period at

2 Cisco?

3    A. Everything else in the IP protocol suite

4 within Cisco. This includes RIP, IGRP, EIGRP, EGP,

5 OSPF, IS-IS. I also had my hands in some of the     10:03:14

6 CLNS stack.

7    Q. What is OSPF?

8    A. Open Shortest Path First routing protocol

9 from the IETF.

10     THE REPORTER: Would you mind repeating     10:03:43

11 that. I'm sorry.

12     THE WITNESS: Open Shortest Path First

13 routing protocol from the IETF.

14     THE REPORTER: Thank you.

15     BY MR. WONG: Q. And the RIP and the IGRP     10:03:51

16 you just mentioned, those are the same RIP and IGRP

17 you were discussing earlier today; correct?

18    A. Yes.

19    Q. You mentioned IS-IS.

20     What is IS-IS?               10:04:00

21    A. This is another routing protocol that comes

22 from the ISO protocol stack and the OSI standards

23 body. It supports routing for both CLNP and IP.

24    Q. What is CLNP?

25    A. Connectionless Network Protocol.     10:04:25

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1    Q. And is that protocol also an industry

2 standard?

3    A. It is.

4    Q. What is the standard-setting body that

5 manages CLNP?               10:04:37

6    A. ISO.

7    Q. What is ISO?

8    A. International Standards Organization.

9 Although that's more formally it's -- the official

10 name is in French, so . . .               10:04:53

11    Q. When you were talking about IS-IS, you

12 mentioned the OSI standards body.

13     Do you remember that?

14    A. That's correct.

15    Q. What is the OSI standards body?     10:05:04

16    A. Open systems -- I don't remember the full

17 expansion. Sorry.

18    Q. Okay. So who was the standard-setting body

19 for IS-IS?

20    A. I believe that was -- falls under ISO which   10:05:20

21 is the child of OSI.

22    Q. And how do you know that, Mr. Li?

23    A. I've read the document.

24    Q. When you say "the document," do you mean

25 the --               10:05:34

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1    A. The standard -- the standard for IS-IS.

2     MR. PAK: Ryan, when you get a chance, can

3 we take a break? We've been going for about an

4 hour.

5     MR. WONG: Sure. We can take a break now.   10:05:45

6     THE WITNESS: Thank you.

7     THE VIDEOGRAPHER: Going off the record.

8 The time is 10:05.

9     (Recess taken from 10:05 a.m. to

10 10:11 a.m.)               10:11:25

11     THE VIDEOGRAPHER: We're back on the

12 record. The time is 10:11.

13     BY MR. WONG: Q. Mr. Li, you used the

14 acronym BGP to refer to the Border Gateway Protocol;

15 correct?               10:11:46

16    A. Correct.

17    Q. Is BGP a commonly known acronym for Border

18 Gateway Protocol?

19    A. No, not common.

20    Q. Okay. Is it a -- strike that.     10:11:54

21     Why do you use the term "BGP" to refer to

22 the Border Gateway Protocol?

23    A. So that's the acronym that is used within

24 the industry.

25    Q. When you say that's the acronym that's used   10:12:10

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1 within the industry, you're referring to the BGP

2 acronym; correct?

3    A. Correct.

4    Q. And when you say "the industry," what do

5 you mean by "the industry"?               10:12:21

6    A. Computer network.

7    Q. And how long as BGP been used as an acronym

8 within the computer networking industry, to your

9 knowledge?

10    A. Since BGP was first introduced, which I     10:12:42

11 believe was approximately 1989.

12    Q. Okay. And why do you use the term "RIP" or

13 R-I-P to refer to Router Information Protocol?

14    A. That is the common acronym used for that

15 protocol.               10:13:21

16    Q. In the networking industry?

17    A. In the networking industry.

18    Q. And how long has RIP been a commonly used

19 acronym in the networking industry?

20    A. I don't know.               10:13:30

21     MR. PAK: Objection. Calls for expert

22 testimony.

23     BY MR. WONG: Q. Okay. But to your

24 knowledge, it is a commonly used acronym in the

25 networking industry today?               10:13:39

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12 (Pages 42 - 45)

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| | |
|---|---|
| 1   A. It is. | 1 working for Cisco in 1991? |
| 2   Q. Do you know when you first started using | 2   A. Approximately three. |
| 3 the acronym RIP? | 3   Q. What was your familiarity with the command |
| 4   A. 1991 when I came to Cisco. | 4 line interface on Cisco's routers before you started |
| 5   Q. And did you come up with the acronym RIP?   10:13:48 | 5 working at Cisco in 1991?                10:16:30 |
| 6   A. No, I did not. | 6   A. So I used Cisco's CLI for those three years |
| 7   Q. Where did you get that acronym from? | 7 between '87 and 1991. |
| 8   A. I heard it from coworkers first. | 8   Q. What level of familiarity -- strike that. |
| 9   Q. And you did not come with the acronym BGP; | 9      Was OSPF a well-known acronym in the |
| 10 correct?                10:14:07 | 10 networking industry? Actually, strike that.        10:17:02 |
| 11   A. Correct. | 11      Is OSPF a well-known acronym in the |
| 12   Q. Where did you first hear the acronym BGP? | 12 networking industry? |
| 13   A. From discussions on a Usenet mailing list. | 13   A. Yes, it is very well-known. |
| 14   Q. What is a Usenet mailing list? | 14   Q. And when did you first hear of the acronym |
| 15   A. Usenet was a system for exchanging        10:14:23 | 15 OSPF, Mr. Li?                10:17:12 |
| 16 messaging in a broadcast fashion, and there were | 16   A. As part of my employment at Cisco. |
| 17 groups within that where people would circulate | 17   Q. Approximately when did you hear -- first |
| 18 messages. And so there was a discussion of routing | 18 hear of OSPF? |
| 19 protocols, and I heard about it first through that. | 19   A. About 1992. |
| 20   Q. And what time period are you talking about   10:14:45 | 20   Q. Approximately how long has "OSPF" been a        10:17:23 |
| 21 here when you first heard the acronym BGP? | 21 well-known term in the networking industry, to your |
| 22   A. This would be somewhere between about 1985 | 22 knowledge? |
| 23 to 1990. | 23      MR. PAK: Objection. Calls for expert |
| 24   Q. So that was before you started working at | 24 testimony. |
| 25 Cisco; correct?                10:15:01 | 25      THE WITNESS: I suspect at least 1989.        10:17:32 |
| Page 46 | Page 48 |
| 1   A. Correct. | 1      BY MR. WONG: Q. Why do you say that, |
| 2   Q. Is "IGRP" also a commonly used term in the | 2 Mr. Li? |
| 3 networking industry? | 3   A. So there's work started on OSPF early on |
| 4   A. It is. | 4 prior to my joining Cisco and prior to my learning |
| 5   Q. And how long, to your knowledge, has "IGRP"   10:15:17 | 5 about it, and I believe that was about '89.        10:17:44 |
| 6 been a commonly used term in the networking | 6   Q. When you say there was work started on |
| 7 industry? | 7 OSPF, what are you referring to by that? |
| 8      MR. PAK: Objection. Calls for expert | 8   A. This is work in the IETF to specify the |
| 9 testimony. | 9 protocol. |
| 10      THE WITNESS: I recall seeing it very early   10:15:24 | 10   Q. And how did you know that there was work        10:18:02 |
| 11 on. I first learned about it in 1987. | 11 started on OSPF by the IETF around 1989? |
| 12      BY MR. WONG: Q. And you did not come up | 12   A. So there was a discussion list about it, |
| 13 with the acronym IGRP; right? | 13 and I looked at some the history of OSPF and looked |
| 14   A. No, I did not. | 14 at the RFC that subsequently came out. I knew that |
| 15   Q. Do you recall how you first learned about   10:15:38 | 15 folks had been working on it for quite some time.        10:18:33 |
| 16 the acronym IGRP? | 16   Q. Who was participating in the discussion |
| 17   A. So I was asked to administer a Cisco router | 17 list about OSPF at that 1989 time period? |
| 18 in 1987 and was -- did Cisco training and learned | 18   A. I -- |
| 19 about IGRP through that training. | 19      MR. PAK: Objection. Calls for |
| 20   Q. And that was before you joined Cisco in   10:15:58 | 20 speculation.                10:18:48 |
| 21 1991; right? | 21      THE WITNESS: So John Moy, Milo Medin, |
| 22   A. That's correct. I was a customer before an | 22 Vince Fuller, Cathy Wittbrodt. Don't remember the |
| 23 employee. | 23 rest. |
| 24   Q. How many years of experience did you have | 24      BY MR. WONG: Q. And how do you know those |
| 25 working with Cisco routers before you started   10:16:15 | 25 individuals you just named were part of the        10:19:12 |
| Page 47 | Page 49 |

13 (Pages 46 - 49)

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| | |
|---|---|
| 1 discussion of OSPF in 1989?<br>2    A. I subsequently worked with them as part of<br>3 IETF and learned of their involvement with OSPF.<br>4    Q. You worked -- strike that.<br>5       When did you work with those individuals as   10:19:31<br>6 part of the IETF?<br>7    A. I started working with them in 1991.<br>8    Q. What companies, if you recall, did those<br>9 individuals work for?<br>10    A. John Moy represented Proteon. Milo Medin   10:19:50<br>11 worked for NASA. Cathy Wittbrodt was at<br>12 Energy Sciences Network at -- as part of<br>13 Lawrence Livermore Labs.<br>14    Q. Did any other vendors -- strike that.<br>15       Did any other companies or organizations   10:20:20<br>16 besides the ones you just mentioned participate in<br>17 OSPF standardization?<br>18       MR. PAK: Objection. Calls for<br>19 speculation. Calls for expert testimony.<br>20       THE WITNESS: So I'm certain that several   10:20:32<br>21 others did. The best way to check would be to look<br>22 at the IETF attendance records.<br>23       BY MR. WONG: Q. When you say you're<br>24 certain that several others did, why are you so<br>25 certain?                          10:20:43<br><div align="right">Page 50</div> | 1 standard?<br>2    A. Not offhand.<br>3    Q. Is IS-IS a well-known acronym in the<br>4 networking industry?<br>5    A. Largely, no.                     10:22:41<br>6    Q. How do you know the IS-IS acronym?<br>7    A. I'm part of a small group who've made use<br>8 of the protocol.<br>9    Q. Is IS-IS a well-known acronym amongst those<br>10 who make use of the IS-IS protocol?        10:23:01<br>11    A. Yes, it is.<br>12    Q. Why is it a smaller group that makes use of<br>13 the IS-IS protocol?<br>14    A. So IS-IS is part of the ISO protocol stack<br>15 which ended up not having a significant market   10:23:15<br>16 share, and thus there's a very small user base.<br>17 Only a very small portion of the I net -- IP<br>18 networking industry ended up using IS-IS, and so the<br>19 number of people that use IS-IS for IP routing is<br>20 very, very small.                     10:23:38<br>21    Q. How long has IS-IS been a well-known<br>22 acronym amongst those who make use of the IS-IS<br>23 protocol, to your knowledge?<br>24    A. At least 1991.<br>25    Q. And when did -- when did you first hear of   10:23:50<br><div align="right">Page 52</div> |
| 1    A. The IETF typically has dozens of people<br>2 operating, working together on any given protocol.<br>3    Q. And how do you -- how do you know that,<br>4 Mr. Li?<br>5    A. So that's -- I started participating in the   10:20:57<br>6 IETF in 1991, and that's their standard way of<br>7 working.<br>8    Q. How many years have you been participating<br>9 in the IETF since 1991?<br>10    A. I participated quite consistently up and   10:21:15<br>11 through about -- from 1991 to about 1999, and then<br>12 it's been sporadic since then.<br>13    Q. When you say the IETF typically has dozens<br>14 of people working together on any given protocol,<br>15 are those people from the same company or different   10:21:42<br>16 companies?<br>17       MR. PAK: Objection. Calls for<br>18 speculation. Vague.<br>19       THE WITNESS: Typically the group --<br>20 working groups that are working on a protocol draw   10:21:54<br>21 people from all sorts of different companies and<br>22 organizations.<br>23       BY MR. WONG: Q. Can you think of any<br>24 protocols from the IETF where different<br>25 organizations did not participate in creating the   10:22:12<br><div align="right">Page 51</div> | 1 the IS-IS acronym?<br>2    A. 1991 when I joined Cisco.<br>3    Q. Is "IP" a well-known industry term in the<br>4 networking industry?<br>5    A. Very well.                        10:24:07<br>6    Q. In your view, what other acronyms are as<br>7 well-known as IP in the networking industry?<br>8       MR. PAK: Objection. Calls for expert<br>9 testimony.<br>10       THE WITNESS: TCP, TCP/IP, WWW.        10:24:19<br>11       BY MR. WONG: Q. How long has IP been a<br>12 well-known acronym in the networking industry?<br>13    A. At least since 1983.<br>14    Q. And when did you first learn of the acronym<br>15 IP?                             10:24:44<br>16    A. Approximately 1984 I took a class in<br>17 computer networking and read the -- first read the<br>18 RFCs on IP.<br>19    Q. Is BGP a -- let me start that again.<br>20       Is "BGP" a well-known term in the        10:25:25<br>21 networking industry?<br>22    A. It is.<br>23    Q. How long has "BGP" been a well-known term<br>24 in the networking industry?<br>25       MR. PAK: Objection. Calls for expert   10:25:34<br><div align="right">Page 53</div> |

<div align="right">14 (Pages 50 - 53)</div>

| | |
|---|---|
| 1 testimony. | 1     What did that entail, maintaining DHCP |
| 2       THE WITNESS: Probably since about 1993. | 2 relay functionality in Cisco IOS? |
| 3       BY MR. WONG: Q. And why do you say that | 3     A. Means that I had to look at the source |
| 4 "BGP" has been a well-known term in the networking | 4 code, read the DHCP RFC, test the behavior of the |
| 5 industry since 1993?                     10:25:47 | 5 Cisco DHCP relay and then repair the functionality     10:28:49 |
| 6     A. I'm an expert in BGP. | 6 in the source code as necessary. |
| 7     Q. Why do you say that you are an expert in | 7     Q. At some point, Mr. Li, you left Cisco's |
| 8 BGP? | 8 employment; correct? |
| 9     A. I helped deploy BGP throughout the | 9     A. Several times. |
| 10 Internet.                          10:26:00 | 10     Q. When you started at Cisco in 1991, when did   10:29:12 |
| 11     Q. What did you do to help deploy BGP | 11 you leave? |
| 12 throughout the Internet? | 12     A. I believe it was 1996. |
| 13     A. So I was responsible for maintaining and | 13     Q. What did you do after you left Cisco in |
| 14 enhancing BGP. I was responsible for doing a great | 14 1996? |
| 15 deal of bug fixing to BGP. And as part of that, I     10:26:17 | 15     A. After a while I joined Juniper Networks.     10:29:28 |
| 16 ended up reimplementing much of Cisco's BGP code and | 16     Q. And what was Juniper's business at the |
| 17 replacing the vast majority of the code that they | 17 time? |
| 18 had. | 18     A. Juniper was a startup in the computer |
| 19     Q. And when did you first hear of the acronym | 19 networking space. |
| 20 BGP?                             10:26:43 | 20     Q. What was Juniper's main product at the     10:29:41 |
| 21     A. Again, I believe it was in the late '80s as | 21 time? |
| 22 part of the Usenet group. | 22     A. They had no product initially, and their |
| 23     Q. Is "DNS" a well-known term in the | 23 first product was a router, the M40, and I believe |
| 24 networking industry? | 24 that came out in 1998. |
| 25     A. It is.                          10:27:07 | 25     Q. Did you work on the M40 Juniper router?     10:29:59 |
| Page 54 | Page 56 |
| 1     Q. How long has "DNS" been a well-known term | 1     A. I did. |
| 2 in the networking industry, Mr. Li? | 2     Q. Now, you said Juniper had no product |
| 3     A. At least since late '80s. | 3 initially. |
| 4     Q. When did you first learn of the term "DNS"? | 4       Did they have no product when you joined |
| 5     A. I was a sys admin at USC at the time.     10:27:19 | 5 them in 1996?                         10:30:16 |
| 6 Could have been anywhere from '83 on. | 6     A. That's correct. We were a startup. We |
| 7     Q. How do you know that "DNS" has been a | 7 had -- I was Employee No. 5. We had an office, and |
| 8 well-known term in the networking industry since the | 8 that was it. |
| 9 late 1980s? | 9     Q. Who were Juniper's competitors? |
| 10     A. So I would helped convert USC from using     10:27:40 | 10     A. At the time it was Cisco. I believe Pluris   10:30:30 |
| 11 host.text, which was previous system, to using DNS. | 11 came along shortly thereafter, but I don't know |
| 12     Q. Is "DHCP" a well-known term in the | 12 exactly when. There was another company called |
| 13 networking industry? | 13 NetStar. Wellfleet. Proteon had not quite gone |
| 14     A. It is. | 14 under. |
| 15     Q. How long has "DHCP" been a well-known term   10:28:00 | 15       That's all I can remember.               10:31:03 |
| 16 in the networking industry? | 16     Q. Now, you said you were Employee No. 5; |
| 17     A. I don't know. | 17 correct? |
| 18     Q. When did you first hear of the acronym | 18     A. Correct. |
| 19 DHCP? | 19     Q. Where did the other first employees at |
| 20     A. Probably 1991.                     10:28:08 | 20 Juniper come from?                      10:31:15 |
| 21     Q. Why do you think you first heard of DHCP in | 21     A. So the founder Pradeep Sindhu was coming |
| 22 1991? | 22 out of Xerox PARC and Sun. Bjorn Liencres I believe |
| 23     A. I helped maintain DHCP relay functionality | 23 was Sun. Dennis Ferguson, I knew him through IETF, |
| 24 in Cisco IOS. | 24 and he was at -- running CAnet, although I don't |
| 25     Q. What did that -- strike that.         10:28:21 | 25 know who he was affiliated with.            10:31:36 |
| Page 55 | Page 57 |

15 (Pages 54 - 57)

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1    Q. What was your involvement in -- strike

2  that.

3        What is Exhibit 139?

4    A. It appears to be a copy of RFC 1887.

5    Q. What was your involvement in RFC 1887,    11:46:30

6  Mr. Li?

7    A. So Yakov and I coauthored or coedited this

8  document in an attempt to document a routing

9  protocol architecture -- a routing architecture for

10 IPv6.                        11:46:45

11    Q. What is IPv6?

12    A. That is the next version of the Internet

13 Protocol. What a widely deployed right now today is

14 known as IPv4. It has the problem that it does not

15 have enough address space and can only support about  11:46:59

16 4 billion hosts.

17        IPv6 is a -- the next version that has been

18 approved by the IETF and we're currently

19 transitioning to IPv6, slowly.

20    Q. We're currently transitioning today, you    11:47:17

21 mean?

22    A. Yes. Twenty years and counting.

23    Q. And I'm sorry. What was the date on the

24 document marked as Exhibit 138, Mr. Li?

25    A. That appears to be March 1995.    11:47:33

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1    Q. Was this document -- strike that.

2        When was the first version of the document

3  marked as 138 completed, to your knowledge?

4    A. I would have to check my notes to be

5  precise but somewhere approximately 1994.    11:48:04

6    Q. Turning back to Exhibit 139, Mr. Li, what

7  is the date on this document?

8    A. December 1995.

9    Q. Is that the publication date for this RFC?

10    A. Yes, it is.    11:48:19

11    Q. And was the document that is shown

12 Exhibit 139, was that completed before the

13 publication date shown on Exhibit 139?

14    A. Yes, it was.

15    Q. Do you know approximately when?    11:48:34

16    A. Somewhere between '93 and '94.

17    Q. Did you come up with the term "IPv6,"

18 Mr. Li?

19    A. No, I did not.

20    Q. Do you know who?    11:48:42

21    A. No. Can't be specific.

22    Q. Is IPv6 a well-known acronym in the

23 networking industry?

24    A. Yes, it is. It is a well-known acronym for

25 Internet Protocol version 6, and this -- this    11:48:53

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1  acronym was designated by the IETF.

2    Q. What do you mean, "this acronym was

3  designated by the IETF"?

4    A. So the IETF, in selecting this protocol to

5  migrate to, decided that we should all refer to    11:49:10

6  version 6 of the protocol as IPv6.

7    Q. And how do you know that the IETF decided

8  that we all should refer to version 6 of the IP

9  protocol as IPv6?

10    A. I was there as part of the discussion.    11:49:27

11    Q. What vendors were part of that discussion?

12    A. I'm sorry. I don't recall.

13    Q. Were there more than one vendor part of

14 that discussion?

15    A. Yes, many.    11:49:40

16    Q. Do you recall if Cisco was part of that

17 discussion?

18    A. I believe so.

19    Q. Do you recall if Juniper was part of that

20 discussion?    11:49:48

21    A. I believe so.

22    Q. Were there any other acronyms relating to

23 routing protocols that the IETF decided should be

24 used to refer to those protocols?

25    A. Yes, many.    11:50:05

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1    Q. What protocols did the IETF decide that

2  everyone in the network industry should use in

3  addition to IPv6?

4        MR. PAK: Objection. Calls for expert

5  testimony.    11:50:18

6        THE WITNESS: So OSPF, BGP, RSVP, LDP,

7  HTTP.

8        BY MR. WONG: Q. Was "IS-IS" a -- a

9  term -- strike that.

10        Did the IETF have any role in the decision    11:50:50

11 for IS-IS to be used by the networking industry?

12    A. Somewhat. Again, IS-IS was originally

13 standardized outside of the IETF. The IETF had the

14 responsibility of managing the usage of IS-IS for

15 Internet Protocol routing.    11:51:14

16    Q. And to your knowledge, Mr. Li, based on

17 your experience working in the industry, did various

18 vendors use those acronyms that you just listed out

19 for me?

20    A. Yes, frequently.    11:51:38

21    Q. To what extent was there any belief that

22 these acronyms for routing protocols were

23 proprietary to any single vendor?

24        MR. PAK: Objection. Calls for

25 speculation.    11:51:58

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28 (Pages 106 - 109)

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| | |
|---|---|
| 1      THE WITNESS: So the acronyms were never | 1    by the court reporter and is attached hereto.) |
| 2  proprietary. | 2      BY MR. WONG: Q. The court reporter has |
| 3      BY MR. WONG: Q. And on what facts do you | 3  marked as Exhibit 140 a document bearing Control |
| 4  base that opinion, Mr. Li? | 4  Nos. ARISTANDCA00025927 to -25933. |
| 5    A. So the acronyms were never published with a   11:52:06 | 5    Mr. Li, have you seen this document before?   11:55:28 |
| 6  trademark or copyright notice attached to them. | 6    A. I believe so. |
| 7    Q. Did you ever believe personally that the | 7    Q. What is the document marked as Exhibit 140? |
| 8  use of OSPF, BGP, IP or any of the other acronyms | 8    A. It appears to be a copy of RFC 1966, BGP |
| 9  that we've been discussing today were proprietary to | 9  Route Reflection. |
| 10  any vendor?       11:52:32 | 10    Q. Did you -- what was your involvement, if   11:55:45 |
| 11    A. No. | 11  any, in the creation of the document marked as |
| 12    Q. In your experience at multiple companies in | 12  Exhibit 140? |
| 13  the networking industry, did anybody else that you | 13    A. So I helped discuss many of the concepts in |
| 14  worked with express the belief to you that any of | 14  this document. As part of the development and |
| 15  these acronyms were proprietary to any vendor?   11:52:48 | 15  deployment of BGP, we found that we had numerous   11:56:02 |
| 16    A. No. | 16  scalability issues that we needed to overcome. |
| 17    Q. So in the 25 years that you have been | 17  There were several approaches proposed. I helped |
| 18  working in the networking industry, you have not | 18  work on the Route Reflection proposal. |
| 19  heard anybody express the belief that any of these | 19      Some of the original work was proposed by |
| 20  acronyms were proprietary to a single vendor?   11:53:08 | 20  Dimitry Haskin of Bay Networks. And as part of the   11:56:20 |
| 21    A. That's correct. | 21  IDR working group, we jointly discussed and came up |
| 22    Q. Turning back to Exhibit 139, Mr. Li, first | 22  with this proposal. |
| 23  page further down, second paragraph from the bottom, | 23      Mr. Bates and Mr. Chandra eventually wrote |
| 24  the word "domain" is used. | 24  up the actual document as you see it here. |
| 25    Do you see that?      11:53:23 | 25    Q. What is BGP Route Reflection?   11:56:34 |
|                  Page 110 |                  Page 112 |
| 1    A. Yes. | 1    A. BGP Route Reflection is a mechanism for |
| 2    Q. Did you come up with the word "domain"? | 2  taking routing information and reflecting it from |
| 3    A. No, I did not. | 3  one router to another through a third router. This |
| 4    Q. Do you know who did? | 4  allows for better scalability because it fixes the |
| 5    A. I believe that was Dr. Rechter.     11:53:31 | 5  problem where BGP previously had where all BGP   11:57:03 |
| 6    Q. Do you know when Dr. Rechter came up with | 6  routers within a particular AS had to be directly |
| 7  the name "domain"? | 7  interconnected. That led to some significant |
| 8    A. I believe that he came up with that term | 8  computational and configuration management |
| 9  during the work for IDRP, and that flowed -- and it | 9  challenges. |
| 10  is semantically equivalent to Autonomous System, and   11:53:49 | 10    Q. Who came up with the phrase "Route   11:57:17 |
| 11  it flowed from his work in IDRP into both this | 11  Reflection"? |
| 12  document and the BGP specification. | 12    A. I believe, but I'm not certain, that that |
| 13    Q. And how do you -- how do you know that, | 13  would be Mr. Haskin. |
| 14  Mr. Li? | 14    Q. And Mr. Haskin, to your recollection, |
| 15    A. Direct work with both of those   11:53:58 | 15  worked for Bay Networks?     11:57:33 |
| 16  specifications. | 16    A. It may have been Wellfleet at the time. |
| 17    Q. Okay. By the time of this RFC, | 17    Q. And just by implication from your answer, |
| 18  December 1995, was "domain" a well-known industry | 18  was Wellfleet acquired by Bay Networks? |
| 19  term? | 19    A. Bay and -- I'm sorry. |
| 20      MR. PAK: Objection. Vague.   11:54:10 | 20    Yes. Bay -- Bay was the merger of Synoptix   11:57:52 |
| 21      THE WITNESS: No, it was not well-known and | 21  and Wellfleet, and I believe he was on the Wellfleet |
| 22  still is not very well-known. | 22  side. |
| 23      MR. WONG: Let's mark this one as 140, | 23    Q. And why do you think that Mr. Haskin came |
| 24  please. | 24  up with the phrase "Route Reflection"? |
| 25    (Exhibit 140 was marked for identification   11:54:45 | 25    A. So I believe he was the first one at IDR   11:58:11 |
|                  Page 111 |                  Page 113 |

29 (Pages 110 - 113)

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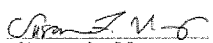Case 5:14-cv-05344-BLF Document 612-7 Filed 11/08/16 Page 33 of 122
Case 5:14-cv-05344-BLF Document 512-8 Filed 09/06/16 Page 33 of 122
CONFIDENTIAL INFORMATION UNDER THE PROTECTIVE ORDER

1 standards organization like IETF?
2 A. I have never seen anyone do that. I have
3 never seen Cisco have any UI patents; so I don't
4 understand.
5 Q. Mr. Li, is there any other views or 04:15:36
6 opinions that you have with respect to this case
7 that you have not shared with us on the record that
8 you would like to share with us now?
9 MR. WONG: Objection. Vague.
10 THE WITNESS: I don't understand your 04:15:55
11 question.
12 BY MR. PAK: Q. We talked about a lot of
13 different topics. I'm giving you the opportunity to
14 provide any further testimony that you would like on
15 any of these topics if you'd like it. 04:16:05
16 A. So I don't understand what intellectual
17 property people think there is in some CLI syntax.
18 The intellectual property is -- that's of
19 significance gets covered in patents. If we thought
20 it was worth protecting, we would copyright it. We 04:16:22
21 would patent it.
22 MR. WONG: Object to the form of the
23 question.
24 BY MR. PAK: Q. Do you believe that
25 copyright is a form of intellectual property? 04:16:34

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1 THE VIDEOGRAPHER: Okay. This marks the
2 end of DVD No. 4 in the deposition of Anthony Li.
3 Going off the record. The time is 4:17. 04:17:29
4 (TIME NOTED: 4:17 p.m.)
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1 MR. WONG: Objection. Calls for opinion
2 testimony.
3 THE WITNESS: It calls for legal testimony.
4 I don't understand.
5 BY MR. PAK: Q. What is your understanding 04:16:44
6 of copyright law?
7 MR. WONG: Same objection.
8 THE WITNESS: Vague as best.
9 BY MR. PAK: Q. I take it, sir, that you
10 haven't analyzed any copyright laws relating to 04:16:56
11 interface, APIs, user interfaces?
12 A. I know that I'm supposed to put a copyright
13 notice in the top of every source code file. That's
14 about all I know.
15 Q. Okay. 04:17:08
16 A. I can't even tell you for certain what I'm
17 supposed to put in the top of the file because
18 nobody can tell me exactly how I should deal with
19 multiple years.
20 MR. PAK: Thank you. Sir, I think those 04:17:18
21 are the questions I have for you today.
22 MR. WONG: I have no further questions.
23 ////
24
25

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1 I, ANTHONY J. LI, do hereby declare under
2 penalty of perjury that I have read the foregoing
3 transcript; that I have made any corrections as appear
4 noted, in ink, initialed by me, or attached hereto; that
5 my testimony as contained herein, as corrected, is true
6 and correct.
7 Executed this _____ day of _____,
8 2016, at _____, _____.
9 (city) (state)
10
11
12
13
14 _____
15 ANTHONY J. LI
16 Volume I
17
18
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65 (Pages 254 - 257)

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CONFIDENTIAL INFORMATION UNDER THE PROTECTIVE ORDER

1        I, the undersigned, a Certified Shorthand
2  Reporter of the State of California, do hereby
3  certify:
4        That the foregoing proceedings were taken
5  before me at the time and place herein set forth;
6  that any witnesses in the foregoing proceedings,
7  prior to testifying, were administered an oath; that
8  a record of the proceedings was made by me using
9  machine shorthand which was thereafter transcribed
10  under my direction; that the foregoing transcript is
11  a true record of the testimony given.
12        Further, that if the foregoing pertains to
13  the original transcript of a deposition in a Federal
14  Case, before completion of the proceedings, review
15  of the transcript [X] was [ ] was not requested.
16        I further certify I am neither financially
17  interested in the action nor a relative or employee
18  of any attorney or any party to this action.
19        IN WITNESS WHEREOF, I have this date
20  subscribed my name.
21        Dated: February 3, 2016
22
23

24        Susan F. Magee
25        CSR No. 11661, RPR, CCRR, CLR

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Page 1

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION

CISCO SYSTEMS, INC.,
        Plaintiff,
vs.          No. 5:14-cv-05344-BLF(PSG)
ARISTA NETWORKS, INC.,
        Defendant.
_____/

CONFIDENTIAL PURSUANT TO THE PROTECTIVE ORDER

VIDEOTAPED DEPOSITION OF TONG LIU
FRIDAY, JANUARY 15, 2016
PALO ALTO, CALIFORNIA

Reported by:
ANDREA M. IGNACIO, CSR, RPR, CRR, CCRR, CLR
CSR LICENSE NO. 9830
JOB NO. 2211574
Pages 1 - 215

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Page 2

1    UNITED STATES DISTRICT COURT
2    NORTHERN DISTRICT OF CALIFORNIA
3        SAN JOSE DIVISION
4
5  CISCO SYSTEMS, INC.,
6        Plaintiff,
7  vs.          No. 5:14-cv-05344-BLF(PSG)
8  ARISTA NETWORKS, INC.,
9        Defendant.
   _____/
10
11
12
13
14        Videotaped Deposition of Tong Liu, taken on
15   Friday, January 15, 2016, pursuant to notice, on
16   behalf of the Defendants, at 610 Page Mill Road,
17   Palo Alto, California before me, ANDREA M. IGNACIO,
18   CSR, RPR, CRR, CCRR, CLR ~ CSR License No. 9830
19
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21
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25

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Page 3

1   A P P E A R A N C E S :
2
3
4   ON BEHALF OF THE PLAINTIFF CISCO SYSTEMS, INC., and
5   the WITNESS:
6      QUINN EMANUEL URQUHART & SULLIVAN, LLP
7      By: SEAN S. PAK, Esq.
8      50 California Street, 22nd Floor
9      San Francisco, California 94111
10     Phone: 415.875.6600
11     seanpak@quinnemanuel.com:
12
13
14   ON BEHALF OF THE DEFENDANT ARISTA NETWORKS, INC.:
15      KEKER & VAN NEST LLP
16      By: RYAN WONG, Esq.
17      633 Battery Street
18      San Francisco, California 94111-1809
19      Phone: 415.773.6682
20      rwong@kvn.com
21
22   ALSO PRESENT: Kevin Foor, Videographer
23
24        ---oOo---
25

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1           I N D E X
2
3   WITNESS: Tong Liu
4
5   EXAMINATION                    PAGE
6   By Mr. Wong                    7, 207
7   By Mr. Pak                     185
8
9          E X H I B I T S
10  EXHIBIT                        PAGE
11  Exhibit 92   Amended Exhibit F; 45 pgs.        67
12  Exhibit 93   IEEE Standard for a Precision     84
13           Clock Synchronization Protocol
14           for Networked Measurement and
15           Control Systems, Bates
16           ARISTANDCA00031733 - '32021;
17           289 pgs.
18  Exhibit 94   IEEE1588 Precision Tine Protocol  100
19           Platform-Independent Software
20           Functional Specification, Bates
21           CSI-CLI-00610555 - '81; 27 pgs.
22  Exhibit 95   6-25-08 E-mail, Subject: Seeking  122
23           permission for adding PTP CLI
24           comments; Bates CSI-CLI-00846643;
25           1 pg.

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Page 7

1    way.

2         If there are any objections to proceeding,

3    please state them at the time of your appearance.

4         And if you would please state your

5    appearances.

6         MR. WONG:  Ryan Wong from Keker & Van Nest

7    for defendant Arista Networks.

8         MR. PAK:  Sean Pak of Quinn Emanuel,

9    representing Cisco and the witness.

10        THE VIDEOGRAPHER:  Thank you.

11        If the court reporter would please swear the

12   witness, we can begin.

13

14             TONG LIU,

15        having been sworn as a witness

16        by the Certified Shorthand Reporter,

17             testified as follows:

18

19             EXAMINATION

20   BY MR. WONG:

21   Q   Good morning, Ms. Liu.

22   A   Good morning.

23   Q   Please state your full name for the record.

24   A   Tong Liu.

25   Q   Do you go by any other names, Ms. Liu?

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1         PALO ALTO, CALIFORNIA

2         FRIDAY, JANUARY 15, 2016

3              9:32 A.M.

4

5

6

7         THE VIDEOGRAPHER:  Good morning.  We are on

8    the record at 9:32 on January 15th of the year 2016.

9    This is the video deposition of Tong Liu.

10        My name is Kevin Foor.  I'm here with court

11   reporter Andrea Ignacio.  And we are here from

12   Veritext Legal Solutions at the request of Keker &

13   Van Nest.

14        This deposition is being held at Wilson

15   Sonsini Goodrich & Rosati in Palo Alto.

16        The caption of the case is Cisco Systems,

17   Inc., v. Arista Networks.  That is case 514-CV-05344

18   ELF BSG.

19        Please note that audio and video recording

20   will take place unless all parties agree to go off the

21   record.  Microphones are sensitive and may pick up

22   whispers, private conversations, and cell

23   interference.

24        I'm not related to any party in this action,

25   nor am I interested financially in the outcome in any

Page 8

1    A   At work, I go with Toni.

2    Q   Could you spell Toni for me, please.

3    A   T-O-N-I.

4    Q   Okay.  Have you gone by Toni Liu for -- for

5    what period of time have you gone by Toni Liu?

6    A   That name is only used at work.  It's not an

7    officially alternative name.

20   Q   Thank you.

21        Who is your current employer, Ms. Liu?

22   A   Aruba Networks.

23   Q   Do you have a work address for Aruba

24   Networks?

25   A   1322 Crossman Avenue, Sunnyvale.

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1    MR. WONG: You testified earlier that PTP was
2  one of the protocols identified to be interoperative.
3    Q  Were there -- were you aware of any other
4  protocols that were identified to be interoperative?
5    A  I'm not aware of that.
6    Q  Okay. But you were aware that PTP was
7  identified?
8    A  Right.
9    Q  And do you know which other vendors supported
10  PTP, based upon your team's investigation, before
11  adding PTP to the industrial Ethernet products?
12    A  Siemens is one vendor.
13    Q  Okay. So Siemens supported PTP in its
14  devices before PTP functionality was added to the
15  Cisco industrial Ethernet devices; correct?
16    MR. PAK: Objection; calls for speculation.
17    THE WITNESS: I don't know the -- I don't
18  recall the exact details, but I do remember Siemens
19  was mentioned in our previous conversations. I mean,
20  the -- was in the team.
21    MR. WONG: Oh.
22    Q  Siemens was --
23    A  I --
24    Q  Sorry. Go ahead.
25    A  Yes, as one important vendor for industrial

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1  devices.
2    Q  And I think you answered this earlier, but
3  your team did not look at the specifics of how Siemens
4  implemented PTP when you started adding PTP commands
5  to Cisco's industrial Ethernet devices; correct?
6    A  We didn't look at any other vendor's device
7  at the time.
8    Q  Okay. Have you seen the IEEE PTP standard
9  before?
10    A  "Before" meaning before today or before --
11    Q  Yes, before today.
12    A  Before today, yes.
13    Q  When was the first time that you saw the IEEE
14  PTP standard?
15    A  That's when I was working on this industrial
16  Ethernet switch development around 2008, I think.
17    Q  Was it your choice to add -- I'm sorry.
18  Strike that.
19    Was it your suggestion to add PTP
20  functionality to the Cisco industrial Ethernet device?
21    A  It was some decision made, and I was the one
22  implementing it.
23    Q  I see.
24    So somebody else at Cisco made the decision
25  to add PTP functionality to the Cisco industrial

Page 95

1  Ethernet device, and you worked on implementing that?
2    A  Right.
3    Q  Okay. And you don't know the reasons behind
4  the decision to add PTP functionality -- well,
5  actually, strike that.
6    So did you see the IEEE PTP standard before
7  you began adding PTP functionality to the Cisco
8  industrial Ethernet device?
9    A  When you say "before," it's before I started
10  writing code?
11    Q  Yes.
12    A  I -- yes, I read the spec --
13    Q  Okay.
14    A  -- for understanding -- to understand how it
15  works.
16    Q  I see.
17    So you read the -- and by "the spec," you
18  mean the IEEE PTP spec?
19    A  Yes.
20    Q  During the break, the court reporter marked
21  as Exhibit No. 93 the document right there to your
22  right.
23    MR. WONG: And counsel, here's a copy for you
24  as well.
25    MR. PAK: Thanks.

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1    MR. WONG: The document bears control numbers
2  AristaNDCA00031733 to '32021.
3    Q  Ms. Liu, you can take your time to look at
4  the document, but the question that I have for you is:
5  Do you recognize this document marked as Exhibit 93?
6    A  Yes, I -- I think this is the one we used, as
7  well as the standard.
8    Q  Okay. Can you read the title of the IEEE
9  specification marked as Exhibit 93.
10    A  "IEEE standard for the precision clock
11  synchronization protocol for network measurement and
12  control systems."
13    Q  Okay. And the -- the -- I guess the number
14  for the standard on the bottom right is IEEE
15  standard 1588-2008.
16    Do you see that?
17    A  Yes, uh-huh.
18    Q  And this is the PTP IEEE standard that we
19  have been talking about in this deposition; correct?
20    A  Yes.
21    Q  Okay. So -- so the exhibit marked as 93 is
22  the standard that you reviewed before you began coding
23  the PTP functionality for the Cisco industrial
24  Ethernet device; correct?
25    A  Yes.

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1    Q  Okay.  And did you read the entire standard
2  before you began working on the PTP functionality?
3    A  Yeah, I believe I read the -- the entire --
4  or the majority part of it.
5    Q  That's -- that's impressive.
6      How -- the standard is -- is several hundred
7  pages long.
8      But you read the whole thing -- you remember
9  reading the whole thing?
10    A  Yes.
11    Q  Did you consult with the standard marked as
12  Exhibit 93 while you were coding the PTP functionality
13  for Cisco's industrial Ethernet devices?
14    A  Yes.  All of the messages format, the field
15  definitions behaviors, are documented here.
16    Q  Okay.  So -- so every PTP functionality --
17  every aspect of PTP functionality that you implemented
18  in Cisco's industrial Ethernet devices are based on
19  the IEEE standard marked as Exhibit 93?
20      MR. PAK:  Objection; mischaracterizes the
21  witness' testimony.
22      MR. WONG:  Q.  Correct?
23      MR. PAK:  Assumes facts not in evidence.
24      THE WITNESS:  There are multiple parts of it
25  for the implementation part.  There is the protocol

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1  part, which are the messages, the state machine, the
2  field definitions.  Those we base off the -- the spec.
3  There are the way we calculate the clock difference.
4  Those are not documented here.  Those are what we
5  developed.  And there's also the CLI command which we
6  came up with separately.
7      MR. WONG:  Q.  When you say "messages," what
8  do you mean by messages?
9    A  So, the PTP protocol has -- if I recall, has
10  multiple set -- is a handshaking message.  So the
11  format of the message, which one follows what, which
12  field is contained in which message, those are defined
13  in the spec.
14    Q  Okay.  And you followed those definitions
15  when you implemented the PTP functionality in Cisco's
16  industrial Ethernet devices; right?
17    A  Yes, the format of the messages.
18    Q  Okay.  You also mentioned field definitions.
19      What do you mean by field definitions?
20    A  Those are inside of the message itself.
21    Q  Okay.  What are fields?
22    A  Like, header, checksum.  There are time
23  stamps inside of the message, and how big -- how wide
24  the field is.  So those -- those are the field
25  definitions which have specific meaning inside of the

Page 99

1  message.
2    Q  And those are specified in the IEEE PTP
3  standard; right?
4    A  Yes.
5    Q  And you followed those standards when
6  implementing the PTP functionality in Cisco's
7  industrial Ethernet products; right?
8      MR. PAK:  Objection; vague.
9      THE WITNESS:  For the messages, yes.
10      MR. WONG:  Q.  And for the field definitions
11  as well?
12    A  The field definition -- if you mean the --
13  how wide the field is, which field needs to follow
14  which one, yes.  But particularly on the name of the
15  field, that may not necessarily be the same as the
16  spec.
17    Q  Okay.  Did you have any role in developing
18  the PTP standard marked as Exhibit 93?
19    A  You mean contributing to the standard itself?
20    Q  Yes.
21    A  No.
22    Q  Did you contribute to the standard that
23  preceded the standard marked as Exhibit 93?
24      And I believe you called that PTP version 1.
25    A  No.

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1    Q  Did you have any role in drafting the
2  document that is marked as Exhibit 93?
3    A  No.
4    Q  Do you know -- I think I know the answer --
5  but do you know if Mr. Bilstead had any role in
6  developing the standard marked as Exhibit 93?
7    A  I don't know anything about that part.
8    Q  Okay.  And you don't know anything about
9  whether Mr. Watve had contributed to the standard
10  marked as Exhibit 93?
11    A  I don't know that part, either.
12    Q  Okay.  Excuse me.
13      MR. WONG:  Can we mark this one as 94.
14      (Document marked Exhibit 94
15      for identification.)
16      MR. WONG:  Okay.  The court reporter has
17  marked Exhibit 94, the document with control
18  Nos. CSI-CLI-00610555 to '610581.
19    Q  Ms. Liu, take your time in looking at this
20  document, but my first question for you is whether you
21  recognize this document?
22    A  I don't recognize this document.
23    Q  Okay.  Have you seen any version of this
24  document, to your knowledge?
25    A  No, I don't recall seeing this document.

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1       MR. WONG: Q. -- that PTP meant precision
2   time protocol?
3       MR. PAK: Same objections.
4       THE WITNESS: I don't think it's well known
5   in the entire networking industry.
6       MR. WONG: Okay.
7    Q   Was there a subset of the networking industry
8   where PTP was known to refer to the PTP in Exhibit 93?
9       MR. PAK: Objection; vague; calls for
10  speculation; assumes facts not in evidence.
11      THE WITNESS: It's not as normal a term as IP
12  or MAC. The -- the term is still -- I think even for
13  people who are working on the Catalyst switches, it's
14  not a very well-known term.
15      MR. WONG: Okay.
16   Q   But certainly, the IEEE standard marked as
17  Exhibit 93 defines the PTP acronym; correct?
18   A   Yes.
19   Q   And uses the PTP acronym --
20   A   Yes.
21   Q   -- to describe precision time protocol;
22  correct?
23   A   True.
24   Q   And it uses that PTP acronym to describe the
25  PTP functionality that you implemented in Cisco's

Page 106

1   industrial Ethernet devices; right?
2       MR. PAK: Objection; assumes facts not in
3   evidence; mischaracterizes the witness' prior
4   testimony.
5       THE WITNESS: In this spec, yes.
6       MR. WONG: Q. Well, is PTP used in Cisco's
7   industrial Ethernet device in a different way than
8   what PTP means in Exhibit 93?
9       MR. PAK: Objection; vague.
10      MR. WONG: Let me rephrase the question.
11   Q   In the five commands that you're associated
12  with in Exhibit 92 --
13   A   Right.
14   Q   -- all of them use the acronym PTP; correct?
15   A   Yes.
16   Q   That PTP refers to the same PTP that is shown
17  on page 8 of Exhibit 93; right?
18      MR. PAK: Objection; vague.
19      THE WITNESS: I think when I chose the
20  command, yes, I used PTP to mean the same as precision
21  time protocol --
22      MR. WONG: Right.
23      THE WITNESS: -- as in the spec.
24      MR. WONG: Q. As in the spec and, in fact,
25  as in -- as on page 8 of Exhibit 93, correct, which

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1   lists the PTP -- which lists PTP as an acronym;
2   correct?
3       MR. PAK: Objection; vague.
4       THE WITNESS: I would say the meanings are
5   the same, that they mean precision time protocol.
6       MR. WONG: Q. Well, the -- the words are the
7   same, too; correct?
8       PTP in the command is the same three letters
9   that appear on page 8 of Exhibit 93; correct?
10   A   It's the same acronym.
11   Q   And they're referring to the same protocol;
12  correct?
13   A   Yes.
14   Q   Now, if you'll turn to page 4 of Exhibit 93.
15   A   (Witness complies.)  Okay.
16   Q   You can take off the -- well --
17   A   This is --
18   Q   -- maybe you want to keep that together,
19  actually.
20   A   Right.
21   Q   On page 4 of Exhibit 93, there is a large
22  heading No. 3 entitled:
23      "Definitions, acronyms, and abbreviations."
24      Do you see that?
25   A   Yes.

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1    Q   And then subsection 3.1 says "Definitions."
2       Do you see that?
3    A   Yes.
4    Q   Definition 3.1.4 in the IEEE PTP
5   specification defines the term "clock."
6       Do you see that?
7    A   Yes, uh-huh.
8    Q   What is the definition of clock in the IEEE
9   standard?
10   A   It's no participating in the precision time
11  protocol, PTP, that is capable of providing a
12  measurement of the passage of time since a defined
13  epoch.
14   Q   And you have read these definitions before
15  you began developing the PTP functionality in Cisco's
16  industrial Ethernet devices; right?
17   A   Yes.
18   Q   So you were familiar with these IEEE defined
19  terms before you began working on the PTP
20  functionality; correct?
21   A   Yes.
22   Q   And you knew they were in the IEEE standard;
23  correct?
24   A   Yes.
25   Q   Okay.  Now, the definition of clock that you

Page 109

1  read, is that your understanding of what a clock is in
2  the context of PTP?
3      MR. PAK: Objection; vague.
4      THE WITNESS: So, in the context of PTP
5  standard or spec, yes, a clock means this.
6      MR. WONG: Q. A clock means what it says on
7  page 4 of --
8      A  Yes.
9      Q  -- Exhibit 93?
10     A  Right.
11     Q  And you -- you -- you did not come up with
12  the term clock in the context of PTP; correct?
13     A  No.
14     Q  All right.
15         Clock is just a defined term in the IEEE
16  standard marked as Exhibit 93; correct?
17     A  Yes.
18     Q  Okay.  If you'll look at page 6 of
19  Exhibit 93.
20     A  (Witness complies.)  Right.
21     Q  Term 3.1.23; do you see that?
22         It defines the term "parent clock" correct?
23     A  Yes.
24     Q  What's the definition of parent clock?
25     A  The master clock to which a clock is

Page 110

1  synchronized.
2      Q  And is that your understanding of what a
3  parent clock is in the context of PTP?
4      A  It is.
5      Q  And you get that understanding from the IEEE
6  standard marked as Exhibit 93; correct?
7      A  Yes.
8      Q  All right.
9         You don't disagree with that definition;
10  correct?
11     A  No.
12     Q  And you don't disagree with the definition of
13  clock in the IEEE PTP standard; right?
14     A  No, I don't.
15     Q  Okay.  Now, the term parent also refers to
16  the parent clock in a PTP context; correct?
17     A  The term parent --
18     MR. PAK: Objection; vague.
19     THE WITNESS: -- in this document --
20     MR. WONG: Yes.
21     THE WITNESS: -- whenever -- yeah, a parent
22  clock is used, it means the definition here.
23     MR. WONG: Sure.
24     THE WITNESS: Is that the question?
25     MR. WONG: Sure.

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1      Q  If you'd turn to page 53 of Exhibit 93.  Let
2  me know when you're there.
3      A  53?
4      Q  The ending control number for that is '31805.
5      A  (Witness complies.)  Yeah, I found it.
6      Q  Okay.  If you look above -- so, near the
7  bottom of the page, you see in bold:
8         "7.6.2 PTP Device Attributes."
9         Do you see that?
10     A  Yes.
11     Q  Okay.  Right above that, there are -- there
12  are two sort of indented bullet points, I guess, or
13  dashes.
14         Do you see that?
15     A  (Witness nods head.)
16     Q  And then, right above that is a sentence that
17  begins with the words "ordinary and boundary clocks."
18         Do you see that?
19     A  Ordinary and boundary clocks.
20     Q  Yep.
21     A  Okay.
22     Q  So that full sentence says:
23         "Ordinary and boundary clocks may keep
24  statistics on the performance of their parents using
25  the following attributes."

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1         Do you see that?
2      A  I haven't found that sentence.
3         Oh, yeah, found it.
4      Q  Okay.  That sentence in the IEEE standard
5  uses the term parents; do you see that?
6      A  Yes.
7      Q  Is it your understanding that -- that that
8  parents term refers to a parent clock?
9      MR. PAK: If you need to take some time to
10  look at the document more closely, you can do that.
11     THE WITNESS: Yes.
12     MR. PAK: Okay.
13     THE WITNESS: I think it -- it's referring to
14  the parent clock.
15     MR. WONG: Right.
16     Q  There's no ambiguity in the context of the
17  IEEE standard that parent refers to parent clock;
18  right?
19     A  Yes.  Here, it means -- yeah, it does mean
20  parent clock.
21     Q  Okay.  So, in the context of the PTP
22  standard, referring to the parent of a clock is
23  referring to the defined term parent clock that we
24  discussed a few minutes ago; correct?
25     A  Yes.

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1    Q   Okay. Now, if you look on that same page,
2    underneath the heading "PTP Device Attributes," you
3    see the term "Priority 1"?
4    A   Yes.
5    Q   What is a PTP device attribute?
6    A   It's certain characteristics of a PTP clock.
7    Q   That are defined by the IEEE standard;
8    correct?
9    A   Yes, uh-huh.
10   Q   Okay. And these are device attributes that
11   are mandatory to be supported to comply with the PTP
12   standard; correct?
13       MR. PAK:  Objection; calls for expert
14   testimony.
15       MR. WONG:  Q.  If you know.
16   A   I didn't see anything as mandatory here.
17   Q   Okay. If you read the description of
18   priority 1, it says:
19       "The attribute priority 1 is used in the
20   execution of the best master clock algorithm; see
21   9.3.2. Lower values take precedence. The
22   initialization value of priority 1 is specified in a
23   PTP profile. The value of priority 1 shall be
24   configurable to any value in the range 0 to 255,
25   unless restricted by limits established by an

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1    applicable PTP protocol" -- I'm sorry -- "PTP
2    profile."
3        Did I read that correctly?
4    A   Yes.
5    Q   Okay. Now, the -- the definition says the
6    value of priority 1 shall be configurable.
7        Do you see that?
8    A   Yes.
9    Q   "Shall" is a mandatory term in the IEEE
10   standard; correct?
11       MR. PAK:  Same objection; calls for expert
12   testimony.
13       THE WITNESS:  Would you please rephrase that
14   question.
15       MR. WONG:  Sure.
16   Q   "Shall" is a mandatory term -- strike that.
17       "Shall" indicates a mandatory requirement in
18   the IEEE standard; correct?
19       MR. PAK:  Objection; calls for expert
20   testimony.
21       MR. WONG:  Q.  And it may help --
22   A   I can say only my understanding, that it's
23   recommending that priority 1 is an attribute, that
24   this is a configurable value.
25   Q   If you'd turn to page 9 of the same document,

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1    Exhibit 93.
2    A   (Witness complies.) Okay.
3    Q   And you see right in the middle of the page,
4    it says "word usage"; correct?
5    A   Uh-huh, I see.
6    Q   And it defines "shall" in 4.2.1.
7        Do you see that?
8    A   Yes.
9    Q   And this is -- and you -- you read the entire
10   standard before you implemented any of the
11   functionality with Cisco's products; right?
12   A   Yes.
13   Q   The definition of "shall" -- well, why don't
14   you please read the definition of "shall."
15   A   "The word 'shall,' which is equivalent to 'is
16   required to,' is used to indicate mandatory
17   requirements strictly to be followed in order to
18   conform to the standard and from which no deviation is
19   permitted."
20   Q   Okay. And you understood that when you read
21   the standard; correct?
22   A   Yes.
23   Q   Okay. If you'd turn back to page 53 that we
24   were just on.
25   A   (Witness complies.) Right.

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1    Q   So, it is a -- it is a requirement to comply
2    with the standard for there to be a value of
3    priority 1 that is configurable as described here on
4    page 53; correct?
5    A   Yes.
6        MR. PAK:  Same -- and again same objection;
7    calls for expert testimony.
8        MR. WONG:  Q.  If you'd turn -- I'm sorry.
9        And -- and do you have any disagreements with
10   the description of priority 1 here on page 53?
11   A   No.
12   Q   Okay. If you'd turn to the next page in
13   Exhibit 93.
14   A   (Witness complies.)
15   Q   At the top, it has another attribute,
16   "priority 2."
17       Do you see that?
18   A   Yes.
19   Q   And the definition of priority 2 also has a
20   sentence that says:
21       "The value of priority 2 shall be
22   configurable to any value in the range 0 to 255,
23   unless restricted by limits established by an
24   applicable PTP profile."
25       Do you see that?

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 1        A  Uh-huh, yes.
 2        Q  So the value of priority 2 -- strike that.
 3        So it's a requirement to comply with the PTP
 4   standard for the value of priority 2 to be
 5   configurable as described here on page 54; correct?
 6        MR. PAK:  Same objection; calls for expert
 7   testimony.
 8        THE WITNESS:  Yes, it's a parameter.
 9        MR. WONG:  Right.
10        THE WITNESS:  Right.
11        Q  And that's your understanding, based upon the
12   standard's own definition of what "shall" means within
13   the document; correct?
14        A  Yes.
15        Q  Okay.  And when you implemented the PTP
16   functionality in Cisco's devices, was it your
17   intention to comply with the standard -- with the IEEE
18   standard marked as Exhibit 93?
19        MR. PAK:  Objection; vague.
20        THE WITNESS:  Again, there were certain
21   multiple aspects of it; right?
22        MR. WONG:  Q.  But, with respect to the two
23   device attributes that we just discussed, was it your
24   intention to comply with the IEEE standard?
25        MR. PAK:  Same objection; vague.
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 1        THE WITNESS:  I think we intended to make
 2   these two parameters as configurable for PTP clock.
 3   So, for that part, yes, the compliance is that we
 4   shall make these as configurable values.
 5        MR. WONG:  Q.  As required by the IEEE
 6   standard marked as --
 7        A  Yes.
 8        Q  -- Exhibit 93; correct?
 9        A  Yes.
10        Q  Is it possible to have vendor
11   interoperability for PTP if you don't comply with the
12   PTP standard?
13        MR. PAK:  Objection; calls for expert
14   testimony; vague.
15        MR. WONG:  Q.  In your view?
16        MR. PAK:  Same objections.
17        THE WITNESS:  In my view, the basic external
18   behaviors needs to be consistent to be interoperable.
19        MR. WONG:  Q.  And are the device attributes
20   that we just discussed, priority 1 and priority 2, are
21   those part of those external behaviors that need to be
22   consistent in order to support interoperability?
23        MR. PAK:  Same objection; vague.
24        THE WITNESS:  I think the priority value
25   being configurable, changeable by users is -- as you
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 1   said, as required -- it's required to be
 2   interoperable --
 3        MR. WONG:  Okay.
 4        THE WITNESS:  -- at the PlugFest.
 5        MR. WONG:  Q.  So, to comply with the PTP
 6   standard, there have to be configurable device
 7   attributes called priority 1 and priority 2 as
 8   described on pages 53 and 54 of Exhibit 93?
 9        MR. PAK:  Objection; calls for expert
10   testimony.  Objection; vague.
11        THE WITNESS:  My understanding is these two
12   parameters, which needs to be configurable.
13        MR. WONG:  Okay.
14        Q  To comply with the PTP standard?
15        A  Yes.
16        Q  Okay.  If you'd turn to page 62 of that same
17   document, Exhibit 93.  Let me know when you're there.
18        A  (Witness complies.)  Yes, I'm on page 63.
19        Q  62.  I'm sorry.
20        A  62.  (Witness complies.)  Okay.
21        Q  Okay.  About two-thirds down on that page 62,
22   there is a subheading 7.7.2.3.
23        Do you see that?
24        A  Yes.
25        Q  And the text next to that is:
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 1        "Sync (multicast) message transmission
 2   interval."
 3        Do you see that?
 4        A  Yes.
 5        Q  Now, the sentence below that says:
 6        "The port DS.log sync interval shall specify
 7   the mean time interval between successive sync
 8   messages, i.e., the sync interval, when transmitted as
 9   multicast messages."
10        Do you see that?
11        A  Yes.
12        Q  Did I read that correctly?
13        A  Yes.
14        Q  So the -- and that sentence, by the way, uses
15   the word "shall" again; correct?
16        A  Yes.
17        Q  That indicates that this is a required -- a
18   requirement of the PTP standard; correct?
19        MR. PAK:  Objection; calls for expert
20   testimony.
21        THE WITNESS:  I -- my understanding is this
22   is to be supported to implement a PTP protocol.
23        MR. WONG:  Q.  And that understanding is
24   based upon the definition of "shall" provided on
25   page 9 of the standard; correct?
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1     A  Yes, uh-huh.
2     Q  That definition of "shall" says that no
3  deviation is permitted; correct?
4        If you need to look at page 9, you can
5  confirm that.
6     A  Right.  No deviation of the behavior, I
7  guess.
8     Q  Okay.
9     A  Right.
10    Q  Is that your understanding?
11    A  Right.
12    Q  So turning -- so you're still on page 62.
13  The IEEE standard uses the term "sync interval" to
14  describe the mean time interval between successive
15  sync messages; correct?
16    A  Sync interval as specified in the text here?
17    Q  Yes.
18    A  Right.  Yes.
19    Q  So, do you agree that the IEEE standard
20  marked as Exhibit 93 on page 62 defines the sync
21  interval as the mean time interval between successive
22  sync messages when transmitted as multicast messages?
23    A  Yes.
24    Q  Okay.  Do you have any disagreements with
25  that definition?

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1     A  No.
2     Q  Okay.  Is that your understanding of what a
3  sync interval is in the context of PTP?
4     A  Yes.
5        MR. PAK:  Objection; calls for expert
6  testimony.
7        MR. WONG:  I'm going to mark two exhibits
8  right now.  This one will be -- what number are we on?
9        THE REPORTER:  95.
10       MR. WONG:  Okay.  This one will be 95.
11       (Document marked Exhibit 95
12        for identification.)
13       MR. WONG:  95.  I'll do them one at a time.
14  Okay.
15    Q  So the court reporter has marked as
16  Exhibit 95 the document with control
17  Nos. CSICLI00846643, and that's it.
18    A  Uh-huh.
19    Q  Ms. Liu, do you recognize this document?
20    A  Yes.
21    Q  Is this one of the documents that refreshed
22  your recollection as to prior events?
23    A  Yes.
24    Q  Okay.  At the top -- first of all, this is an
25  e-mail; correct?

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1     A  Yes.
2     Q  And at the top of Exhibit 95, there is a
3  "From" field on the e-mail.
4        Do you see that?
5     A  Yes.
6     Q  And it says "Toni Liu."
7        Do you see that?
8     A  Yes.
9     Q  That's you; correct?
10    A  Yes.
11    Q  Your e-mail address while at Cisco was
12  liut@cisco.com; correct?
13    A  Yes.
14    Q  Now, was your e-mail address the same as it
15  was -- in your second period at Cisco as it was at
16  your first period at Cisco?
17    A  It's the same.
18    Q  It's the same?
19    A  Yes.
20    Q  Okay.  And this was -- this e-mail, marked as
21  Exhibit 95, was sent on June 25th, 2008; correct?
22    A  Yes.
23    Q  Okay.  All right.  Set that down for a
24  moment.
25       MR. WONG:  Let's mark this one as Exhibit 96.

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1        (Document marked Exhibit 96
2         for identification.)
3        MR. WONG:  This is 96.
4     Q  The court reporter has marked as Exhibit 96 a
5  document bearing control Nos. CSICLI00608739 to '740.
6  Please take a moment to look at this document.
7     A  (Witness complies.)  Okay.
8     Q  This is also an e-mail; correct?
9     A  Yes.
10    Q  At the very top, there's a "From" field for
11  this e-mail.
12       Do you see that?
13    A  Yes.
14    Q  It also says it's from liut@cisco.com, Toni
15  Liu?
16    A  Yes.
17    Q  That's you; correct?
18    A  True.
19    Q  Do you have any doubt that you sent this
20  e-mail marked as Exhibit 96?
21    A  I don't have any doubt I sent it.
22    Q  Okay.  And the exhibit marked as Exhibit 95,
23  do you have any doubt that you sent that e-mail?
24    A  No.
25    Q  Okay.  Now, if you look at Exhibit 95 and

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 1        AFTERNOON SESSION
 2             1:41 P.M.
 3
 4
 5
 6        THE VIDEOGRAPHER:  We are back on the record.
 7   It is 1:41.
 8        MR. WONG:  Q.  So, Ms. Liu, before the lunch
 9   break, we talked about the five commands that are
10   associated with you in Exhibit 92.
11        A   Yes.
12        Q   One of the commands is "PTP priority 1."
13        A   Yes.
14        Q   Do you see that?
15        A   Uh-huh.
16        Q   What is the function that the "PTP
17   priority 1" command performs?
18        A   It configures the priority 1 parameter for
19   the PTP clock.
20        Q   Okay.  And when you say "for the PTP clock,"
21   you mean PTP as defined by the IEEE standard; right?
22        A   Yes.
23        Q   You're not talking about a different PTP
24   that's separate from the IEEE standard; right?
25        A   No.
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 1        Q   Okay.  And the PTP in the command "PTP
 2   priority 1" refers to the IEEE standard; correct?
 3        MR. PAK:  Objection; vague.
 4        THE WITNESS:  It refers to, yeah, PTP.
 5        MR. WONG:  Q.  It refers to the IEEE PTP
 6   standard that we marked as Exhibit 93; correct?
 7        A   Yes.
 8        Q   Okay.  And the use of the word PTP in all
 9   five of the commands that are associated with you in
10   Exhibit 92, they all come from the IEEE standard
11   marked as Exhibit 93; correct?
12        MR. PAK:  Objection; vague; mischaracterizes
13   the witness' testimony.
14        THE WITNESS:  You mean the PTP --
15        MR. WONG:  Q.  Let me ask the question --
16        A   -- word in the command?
17        Q   Yes.
18        Let me ask a clean question.
19        The use of the word PTP in all five of the
20   commands that are associated with you in Exhibit 92 --
21        A   Right.
22        Q   -- that word came from the PTP IEEE standard
23   that was marked as Exhibit 93; correct?
24        MR. PAK:  Same objections.
25        THE WITNESS:  Yes, it means the same.
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 1        MR. WONG:  Okay.
 2        Q   And you -- in describing the function
 3   performed by the "PTP priority 1" command, you
 4   testified that it configures the priority 1 parameter
 5   for the PTP clock; correct?
 6        A   Yes.
 7        Q   And the priority 1 parameter for the PTP
 8   clock, that's the same priority 1 parameter that we
 9   discussed in Exhibit 93; correct?
10        A   When you say "parameter," I think they are a
11   little different in the CLI and the spec.
12        Q   How are they different?
13        A   The -- in the spec, it's the attribute of the
14   clock; right?  When I say parameter, I mean the -- in
15   the context of the CLI command is a parameter.
16        Q   Oh, I see.
17        So -- so the word priority 1 in the "PTP
18   priority 1" CLI command is a parameter of the command?
19        A   Yes.
20        Q   That's what you mean by --
21        A   Right.
22        Q   -- parameter?
23        A   Right.
24        Q   Okay.  Now, does the priority 1 parameter in
25   the CLI command "PTP priority 1," does that refer to
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 1   the priority 1 attribute in the IEEE standard marked
 2   as Exhibit 93?
 3        MR. PAK:  Objection; vague.
 4        THE WITNESS:  Yes.  I think I chose it for
 5   the intention to mean the priority 1 attribute of the
 6   clock.
 7        MR. WONG:  Q.  And is your answer the same
 8   for the command "PTP priority 2"?
 9        Is the priority 2 command parameter -- does
10   that refer to the priority 2 attribute in the IEEE
11   standard marked as Exhibit 93?
12        MR. PAK:  Same objection.
13        THE WITNESS:  It's referring to the same --
14   that attribute, yes.
15        MR. WONG:  Q.  That attribute in the IEEE
16   standard?
17        A   In the IEEE standard, yes.
18        Q   Okay.  And you knew about the priority 1 and
19   priority 2 attributes in the IEEE standard before you
20   started adding the "PTP priority 1" and "PTP
21   priority 2" commands to the iOS software; correct?
22        A   Yes, I read the spec.
23        Q   And you were aware of those two particular
24   attributes before you started adding the "PTP
25   priority 1" and "PTP priority 2" commands to Cisco's
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1  routing software; right?
2      A  Yes.
3      Q  How long did it take you to come up with the
4  "PTP priority 1" command?
5      A  I don't remember how long it took for me to
6  come up with the list of CLI commands.
7      Q  Okay. I'm just asking about the -- the one
8  command, "PTP priority 1."
9      A  Right.
10     Q  Did -- did that take you an hour to come up
11 with that command?
12         MR. PAK: Objection; vague.
13         THE WITNESS: You mean just to decide on the
14 syntax of the command?
15         MR. WONG: On the two words in the command.
16 That's right.
17     Q  How long did it take you to decide on the
18 two words, "PTP priority 1," in that command?
19     A  I don't remember.
20     Q  Did it take you more than a day?
21         MR. PAK: Objection; vague.
22         THE WITNESS: Maybe not. I don't recall the
23 details of -- of this level.
24         MR. WONG: Okay.
25     Q  Do you --

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1      A  How long, yeah.
2      Q  Are you done with your answer?
3      A  Right.
4         Yes, I'm done with my answer.
5      Q  Okay. Do you know if it took you just a few
6  minutes?
7         MR. PAK: Same objections.
8         THE WITNESS: I don't recall the details of
9  how long it took.
10         MR. WONG: Okay.
11     Q  So, you don't know whether it took you a few
12 minutes or more than a day to decide upon the
13 two words "PTP priority 1"; is that correct?
14     A  I don't recall the details on that.
15     Q  Okay. And are -- are there any documents
16 that would refresh your memory of how long it took you
17 to come up with the "PTP priority 1" command?
18     A  I don't see anything in the conversation
19 here. So the e-mail here was after I came up with the
20 command.
21     Q  Okay. Were there any other e-mails that you
22 reviewed in preparation for this deposition that
23 refreshed your recollection about the five commands
24 that are associated with you?
25     A  It's the same e-mail that you give me

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1  today --
2      Q  Okay.
3      A  -- that I saw.
4      Q  So the --
5      A  Yeah.
6      Q  So the same e-mails that were marked as
7  exhibits in today's deposition are the ones that
8  refreshed your memory?
9      A  Right.
10     Q  Okay. How long did it take you to write
11 the -- strike that.
12         Did you write the implementing source code
13 for the "PTP priority 1" command
14     A  I did write the source code for implementing
15 this command.
16     Q  How long did it take you to write the source
17 code for the "PTP priority 1" command?
18     A  I don't remember any time frame on this.
19 It's -- it's been a while.
20     Q  Do you know if it took you longer to write
21 the implementing source code for the "PTP priority 1"
22 command than it took you to choose the two words "PTP
23 priority 1"?
24         MR. PAK: Objection; vague.
25         THE WITNESS: I would think it took longer to

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1  implement it.
2         MR. WONG: Q. Would your answer be the same
3  for the other four commands that are associated with
4  you in Exhibit 92?
5      A  I know I gave some thought on these commands
6  when I came up with them. But particular to how long
7  it took for me to do any of these, that's the part I
8  don't remember anymore.
9         But I did remember it's among all of the
10 attributes of -- or things mentioned in the spec, I
11 chose a particular subset of things which I think I
12 should provide a CLI command for user to configure
13 them.
14         So that's the -- that's -- I think it's part
15 of the decision-making, and that could have taken some
16 time. But how long I took, that's the part I don't
17 remember now.
18     Q  Okay. And my question was more about your
19 testimony about the "PTP priority 1" command, where
20 you said it took longer to write the implementing code
21 for that command than it did to choose the two words
22 in the command.
23         Do you -- do --
24     A  I --
25     Q  -- do you remember testifying to that effect?

36 (Pages 141 to 144)

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 1      A  Yes.  I -- I agree --
 2      Q  Okay.
 3      A  -- that's likely true.
 4      Q  So that's likely true for the other four
 5   commands as well?
 6         MR. PAK:  Objection; vague.
 7         THE WITNESS:  That's -- yeah, I can always
 8   say that's likely true.
 9         MR. WONG:  Okay.
10      Q  And you say "it's likely true" just based
11   upon your experience programming?
12      A  It's -- yeah, it's just based on my
13   experience working with CLI commands.
14      Q  What type of programming is required to
15   implement a command like "PTP priority 1"?
16      A  It's a C programming that we were using.  So
17   for the -- in general, you do the front end of
18   interface, so you come up with the command.  But then
19   you -- then you spend time implementing hooking it up
20   to the back-end code.
21      Q  Excuse me.
22         And when you say "back-end code," is that the
23   same thing as the implementing source code?
24         That's the term that I was using.
25         Is that the same thing, in your
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 1   understanding?
 2      A  Yes.
 3         There -- so, when the CLI command is
 4   received, something needs to happen based on what has
 5   been configured as being specified as the parameter.
 6   So that's the interface I was referring to, that I
 7   hook up to the back-end behavior of the clock.
 8      Q  And the back-end behavior for each command
 9   that you are associated with in Exhibit 92, did you
10   write that source code?
11      A  I did write the source code.
12      Q  Did you have anyone else's help in writing
13   the source code for those five commands associated
14   with you in Exhibit 92?
15      A  No.  I wrote all of them.
16      Q  The "PTP sync interval" command --
17      A  Yes.
18      Q  Well, actually, just for clarity, what
19   function does the "PTP priority 2" command perform?
20      A  It configures another parameter which helps
21   to determine the -- the clock.
22      Q  And that other parameter you're talking about
23   is the priority 2 attribute that is defined by the
24   IEEE standard marked as Exhibit 93; correct?
25      A  Yes.
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```
 1      Q  Okay.  What function does the "PTP sync
 2   interval" command perform?
 3      A  It configures how often the clock syncs with
 4   the master.
 5      Q  And do you recall earlier we were looking at
 6   the IEEE standard marked Exhibit 93 and a term called
 7   sync interval in there?
 8      A  Right.
 9      Q  Is the sync interval, that the "PTP sync
10   interval" command refers to, the same sync interval
11   that we discussed in Exhibit 93?
12         MR. PAK:  Objection; vague.
13         THE WITNESS:  I think that was -- this
14   command was used -- was defined to be used to
15   configure that part of the clock.
16         MR. WONG:  Right.
17      Q  And by "that part of the clock," you mean the
18   sync interval attribute defined by the IEEE PTP
19   standard; right?
20      A  Yes.
21      Q  Now, you chose the term priority 1 because
22   priority 1 is an attribute that's in the IEEE
23   standard; right?
24         MR. PAK:  Objection; vague.
25         THE WITNESS:  You mean when I wrote the
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```
 1   command?
 2         MR. WONG:  Q.  When you --
 3      A  When I -- when I chose to use priority 1;
 4   right?
 5      Q  Yes, that's what I'm asking.
 6      A  Yes.  When I chose the word, I meant to
 7   configure this attribute for the clock.  That was
 8   true.
 9      Q  And this attribute for the clock, you're
10   referring to the priority 1 attribute that's defined
11   in the IEEE standard; right?
12      A  Yes.
13      Q  And your answer is the same for the
14   priority 2 attribute defined in the IEEE standard,
15   correct, with respect to the PTP priority 2 command?
16      A  Yes.
17      Q  And you chose the words sync interval because
18   the IEEE standard marked as Exhibit 93 described --
19   strike that.
20         You chose the words sync interval because the
21   IEEE standard marked as Exhibit 93 also used the term
22   sync interval; correct?
23         MR. PAK:  Objection; vague.
24         THE WITNESS:  When you say that, it makes me
25   feel that you -- it's a direct translate from the spec
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1  Q  You were aware that the terms priority 1,
2  priority 2, sync interval, and PTP were defined in the
3  IEEE specification marked as Exhibit 93 before you
4  added those three commands to Cisco's routing
5  software; correct?
6  A  I'm aware of those terms being defined in the
7  1588 standard.
8  Q  Okay.  Before you added those three commands
9  to the Cisco software; correct?
10  A  Yes.
11  Q  Okay.  Now, "show PTP clock" is another
12  command that you're associated with; correct?
13  A  Yes.
14  Q  What's the function performed by the "show
15  PTP clock" command?
16  A  It shows the state and status of the clock.
17  And I don't recall the entire output from the command,
18  but I think that's probably summarize majority of the
19  output.
20  Q  Okay.  And as we discussed earlier in today's
21  deposition, the PTP IEEE specification defines the
22  term clock; correct?
23  A  It defined the term clock, yes.
24  Q  Okay.  And the clock that is referred to in
25  the command "show PTP clock" is the clock that is

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1  defined in the PTP standard; correct?
2  MR. PAK:  Objection; vague.
3  THE WITNESS:  Well, the command shows the PTP
4  clock status.
5  MR. WONG:  Q.  And when you refer to "the PTP
6  clock" in that response you just gave, you're
7  referring to the clock that is defined in the PTP
8  standard; correct?
9  A  Yes, it means the clock.
10  Q  Now, the -- the word "show" in that command,
11  were there other commands in iOS that used the word
12  "show" before you added this "show PTP clock" command
13  to the software?
14  A  Yes.
15  Q  Okay.  You were familiar that other commands
16  used the first word of "show" to display information
17  before you added the "show PTP clock" command;
18  correct?
19  A  Yes.
20  Q  Okay.  So you -- you simply followed what
21  other commands were doing when you chose the word
22  "show" in "show PTP clock"; is that right?
23  MR. PAK:  Objection; assumes facts not in
24  evidence; mischaracterizes the witness' testimony.
25  MR. WONG:  Q.  If anything that I'm saying --

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1  A  "Show" is a --
2  Q  Sorry.
3  A  -- big category of commands.  Like, there is
4  debug.  There is config.  There is show.  So show is
5  one big category of commands.
6  Q  And there was a big -- and that category of
7  commands, the show commands, existed before you added
8  the "show PTP clock" command to the software; correct?
9  A  Yes.
10  Q  And you were just building upon that category
11  of commands when you used the word "show" in "show PTP
12  clock"; correct?
13  MR. PAK:  Objection; mischaracterizes the
14  witness' testimony.
15  THE WITNESS:  Yes, I think that -- that was
16  the intention.
17  MR. WONG:  Q.  And is the same
18  explanation -- does the same explanation apply to
19  "show PTP parent" for the show aspect of that command?
20  A  Yes, for the show aspect of the command, yes.
21  Q  Okay.  What function does the "show PTP
22  parent" command perform?
23  A  It shows the status of the parent clock.
24  Q  When you say "the parent clock," are you
25  referring to the parent clock as defined in the PTP

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1  standards?
2  A  Yes.
3  Q  And you recall discussing the definition of
4  parent clock in the standards earlier in this
5  deposition; correct?
6  A  Yes.
7  Q  And another shorthand used by the IEEE
8  standard for parent clock is simply parent; correct?
9  MR. PAK:  Objection; vague.
10  THE WITNESS:  Can you refer me to that page.
11  MR. WONG:  Sure, sure, absolutely.
12  Q  I think it's on page 53 of Exhibit 93.  It's
13  in that sentence maybe two-thirds of the way down on
14  page 53 that starts with:
15  "Ordinary and boundary clocks may keep
16  statistics."
17  A  Uh-huh.
18  "Using the following attribute."
19  Okay.
20  Q  So you would agree that, in the IEEE
21  standard, it uses the term parent as shorthand for
22  parent clock?
23  A  Yes.
24  Q  Okay.  Do you know if commands that use the
25  word "show" were used before they were used in Cisco's

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1    (WHEREUPON, the deposition ended
2    at 3:36 p.m.)
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1    CERTIFICATE OF REPORTER
2    I, ANDREA M. IGNACIO, hereby certify that the
3    witness in the foregoing deposition was by me duly
4    sworn to tell the truth, the whole truth, and nothing
5    but the truth in the within-entitled cause;
6    That said deposition was taken in shorthand
7    by me, a disinterested person, at the time and place
8    therein stated, and that the testimony of the said
9    witness was thereafter reduced to typewriting, by
10   computer, under my direction and supervision;
11   That before completion of the deposition,
12   review of the transcript [x] was [ ] was not
13   requested. If requested, any changes made by the
14   deponent (and provided to the reporter) during the
15   period allowed are appended hereto.
16   I further certify that I am not of counsel or
17   attorney for either or any of the parties to the said
18   deposition, nor in any way interested in the event of
19   this cause, and that I am not related to any of the
20   parties thereto.
21   Dated: 01/29/2016
22
23   <%signature%>
24   ANDREA M. IGNACIO,
25   RPR, CRR, CCRR, CLR, CSR No. 9830

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1    J U R A T
2
3    I, TONG LIU, do hereby certify under penalty
4    of perjury, that I have read the foregoing
5    transcript of my deposition in the matter of
6    Cisco Systems, Inc., vs. Arista Networks, Inc.,
7    taken on January 15, 2016; that I have made such
8    corrections as appear noted herein in ink,
9    initialed by me; that my testimony as contained
10   herein, as corrected, is true and correct.
11   DATED this ____ day of _____,
12   2015, at _____.
13   _____
14   SIGNATURE OF WITNESS
15
16   NOTARIZATION (If Required)
17   State of _____
18   County of _____
19   Subscribed and sworn to (or affirmed) before me on
20   this _____ day of _____, 20_____,
21   by _____, proved to me on the
22   basis of satisfactory evidence to be the person who
23   appeared before me.
24   Signature: _____ (Seal)
25

Page 1

1              UNITED STATES DISTRICT COURT

2            NORTHERN DISTRICT OF CALIFORNIA

3                  SAN JOSE DIVISION

4

5   CISCO SYSTEMS, INC.,          )

                                  )

6              Plaintiff,         )

                                  ) Case No.

7         vs.                     ) 5:14-cv-05344-BLF  (PSG)

                                  )

8   ARISTA NETWORKS, INC.,        )

                                  )

9              Defendant.         )

    _____)

10

11

12      HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

13

14

15   VIDEOTAPED DEPOSITION OF KIRK LOUGHEED

16            Palo Alto, California

17         Friday, November 20, 2015

18                Volume I

19

20

21

22   Reported by:

     CARLA SOARES

23   CSR No. 5908

24   Job No. 2187110

25   Pages 1 - 189

Case 5:14-cv-05344-BLF   Document 729-1   Filed 12/09/16   Page 51 of 123
Case 5:14-cv-05344-BLF   Document 612-7   Filed 11/08/16   Page 50 of 122
Case 5:14-cv-05344-BLF   Document 512-8   Filed 09/06/16   Page 50 of 122

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 1              UNITED STATES DISTRICT COURT
 2            NORTHERN DISTRICT OF CALIFORNIA
 3                  SAN JOSE DIVISION
 4
 5   CISCO SYSTEMS, INC.,    )
                             )
 6          Plaintiff,  )
                        ) Case No.
 7      vs.       ) 5:14-cv-05344-BLF (PSG)
                  )
 8   ARISTA NETWORKS, INC.,  )
                             )
 9          Defendant.  )
     _____)
10
11
12
13
14
15
16        VIDEOTAPED DEPOSITION OF KIRK LOUGHEED,
17   Volume I, taken on behalf of Defendant, at
18   650 Page Mill Road, Palo Alto, California, beginning
19   at 9:19 a.m., and ending at 6:15 p.m., on Friday,
20   November 20, 2015, before CARLA SOARES, Certified
21   Shorthand Reporter No. 5908.
22
23
24
25
                                            Page 2
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 1   APPEARANCES (Continued):
 2
 3   For the Defendant:
 4        KEKER & VAN NEST LLP
 5        BY: BRIAN L. FERRALL, Attorney at Law
 6        BY: RYAN WONG, Attorney at Law
 7        633 Battery Street
 8        San Francisco, California 94111
 9        415.391.5400
10        bferrall@kvn.com
11        rwong@kvn.com
12
13   ALSO PRESENT: Sean Grant, Video Operator
14             --o0o--
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 1   APPEARANCES:
 2
 3   For the Plaintiff and the Witness:
 4        QUINN EMANUEL URQUHART & SULLIVAN, LLP
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17
18
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21
22
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                                            Page 3
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 1                      INDEX
 2   WITNESS
 3   KIRK LOUGHEED                    EXAMINATION
     Volume I
 4
 5        BY MR. FERRALL               10
 6
 7             EXHIBITS
 8   NUMBER        DESCRIPTION          PAGE
 9   Exhibit 29  Document headed "Internet      73
10        Protocol,"
11        Bates ARISTANDCA0031553 - 1601
12
13   Exhibit 30  Document headed "DoD Internet  73
14        Host Table Specification"
15
16   Exhibit 31  Document headed "An Ethernet   73
17        Address Resolution Protocol or
18        Converting Network Protocol
19        Addresses to 48.bit Ethernet
20        Address for Transmission on
21        Ethernet Hardware,"
22        Bates ARISTANDCA0003130 - 1639
23
24
25
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```
 1        Palo Alto, California            08:37:04
 2        Friday, November 20, 2015
 3           9:19 a.m.
 4
 5        P R O C E E D I N G S          08:37:10
 6        THE VIDEO OPERATOR:  Good morning.  We're
 7   on the record.  The time is 9:19 a.m., and the date
 8   is November 20th, 2015.  This begins the videotaped
 9   deposition of Kirk Lougheed.
10        My name is Sean Grant, here with our court    09:19:25
11   reporter, Carla Soares.  We're here from Veritext
12   Legal Solutions at the request of counsel for
13   defendant.
14        This deposition is being held at Wilson
15   Sonsini in Palo Alto, California.  The caption of   09:19:34
16   this case is Cisco Systems, Inc., versus Arista
17   Networks, Inc., Case No. 5:14-CV-05344-BLF.
18        Please note that audio- and
19   video-recording will take place unless all parties
20   have agreed to go off the record.  Microphones are  09:19:54
21   sensitive and may pick up whispers, private
22   conversations, or cellular interference.
23        At this time, will counsel please identify
24   themselves and state whom they represent.
25        MR. FERRALL:  Brian Ferrall of Keker &         09:20:06
                                      Page  9
```

Pages 6 to 9

| | |
|---|---|
| 1  right now.                                12:58:39 | 1  calls for a conclusion.                     13:03:06 |
| 2       Mr. Lougheed, you have to understand, | 2       THE WITNESS: Documents whose name I do |
| 3  we've got a lot to cover today, and I need to -- | 3  not recall. |
| 4       A  And I'm also under oath, and I want to | 4  BY MR. FERRALL: |
| 5  make sure my replies to your answers (sic) are   12:58:47 | 5       Q  Can you describe generally what they were?   13:03:16 |
| 6  correct. | 6       A  They were documents that described a |
| 7       Q  Okay.  So I'm asking you -- you can put | 7  packet format and described an associated state |
| 8  the document down, frankly. | 8  machine. |
| 9       Do you ever recall reviewing an RFC for an | 9       Q  Is the address resolution protocol |
| 10  address resolution protocol?              12:58:58 | 10  referred to simply by the acronym ARP?       13:03:59 |
| 11       A  Yes, I do recall reviewing a document -- | 11       A  There's a general concept of an address |
| 12  it may have been an RFC -- on address resolution. | 12  resolution protocol, and then there's one, possibly |
| 13       Q  Do you know who developed address | 13  more, that are -- may be described in various |
| 14  resolution protocols? | 14  documents from the IETF. |
| 15       A  I don't recall.                    12:59:20 | 15       Q  When did you first hear -- have you ever   13:04:52 |
| 16       Q  Did you contribute to that field? | 16  heard the address resolution protocol abbreviated as |
| 17       A  No. | 17  ARP? |
| 18       Q  All right.  Do you know David Plummer? | 18       A  Yes. |
| 19       A  I have heard the name before but I don't | 19       Q  When did you first hear that abbreviation? |
| 20  know the person.                           12:59:31 | 20       A  I don't recall -- I don't recall the       13:05:17 |
| 21       Q  How many IETF RFCs have you authored in | 21  precise time. |
| 22  whole or in part? | 22       Q  Was it while you were still at Stanford? |
| 23       A  Two, maybe three. | 23       A  It certainly could have been. |
| 24       Q  What were the subject or subjects of those | 24       Q  Did you develop any features for the |
| 25  RFCs?                                       13:00:07 | 25  address resolution protocol yourself?       13:05:52 |
| Page 78 | Page 80 |
| 1       A  They were all on the border gateway      13:00:09 | 1       MR NEUKOM: Objection  Vague         13:05:56 |
| 2  protocol. | 2       THE WITNESS: I do not understand your |
| 3       Q  Has Cisco ever had any policies about | 3  question  What do you mean, develop features for |
| 4  their employees submitting RFCs to the IETF? | 4  the address resolution protocol? |
| 5       A  I'm not aware of any specific policies.   13:01:02 | 5  BY MR  FERRALL:                             13:06:12 |
| 6       Q  Did the software that you worked on at | 6       Q  Fair enough.  Let me ask it a different |
| 7  Stanford, the routing and terminal server software | 7  way. |
| 8  we talked about, did that include an address | 8       Did you contribute to any IETF RFC |
| 9  resolution protocol? | 9  relating to the address resolution protocol? |
| 10       MR. NEUKOM: Objection to form.  Vague.   13:02:09 | 10       MR NEUKOM: Objection  Asked and         13:06:27 |
| 11  BY MR. FERRALL: | 11  answered |
| 12       Q  I should say an address resolution | 12       THE WITNESS: No |
| 13  protocol feature. | 13  BY MR  FERRALL: |
| 14       MR. NEUKOM: Same objection. | 14       Q  Did you develop features at -- while at |
| 15       THE WITNESS: Yes.                        13:02:23 | 15  Cisco that relate to ARP, if you don't mind me using   13:06:44 |
| 16  BY MR. FERRALL: | 16  the acronym? |
| 17       Q  And what were the sources of information | 17       A  I don't understand the question |
| 18  for you in order to -- well, strike that. | 18       Q  Who is Glenn Truitt? |
| 19       Did you write software for the address | 19       A  He's a -- at my time at Stanford, he was a |
| 20  resolution protocol feature?               13:02:38 | 20  graduate student                            13:08:37 |
| 21       A  Yes. | 21       Q  Did you work with him while at Stanford? |
| 22       Q  And what were the sources of information | 22       A  Briefly |
| 23  that you used to prepare that address resolution | 23       Q  In what capacity? |
| 24  protocol feature? | 24       A  I recollect that he may have written a |
| 25       MR. NEUKOM: Objection to form.  Vague,   13:02:58 | 25  user guide to the software at the time, but that's   13:09:21 |
| Page 79 | Page 81 |

Pages 78 to 81

| | |
|---|---|
| 1      MR. FERRALL: Let's mark this as the next    15:26:35 | 1   message indicates that you are looking at an error    15:29:49 |

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    1       MR. FERRALL: Let's mark this as the next      15:26:35
    2   exhibit.
    3       (Exhibit 38 was marked for identification
    4   and is attached hereto.)
    5   BY MR. FERRALL:                                   15:26:37
    6       Q  Exhibit 38 is a set of emails between you
    7   and Mr. Remaker, among others.  It bears control
    8   numbers CSI-ANI-00043306.
    9       A  Okay.  I'd like to read this.
   10       Q  First let me ask you the question so you   15:27:19
   11   know what to look for.
   12       A  I will forget the question by the time I'm
   13   done reading this.
   14       Q  Well, Mr. Lougheed, that's not the way it
   15   works, actually.  I ask the question and you answer  15:27:28
   16   it.
   17       A  Okay.
   18       Q  If you can't answer it, then you tell me.
   19       My only question is, did you send the
   20   email that's at the top of Exhibit 38, the one at   15:27:38
   21   12-11-2008 at 10:14 p.m.?
   22       MR. NEUKOM: Mischaracterizes the document
   23   on its face.
   24       And I know that Mr. Ferrall would like you
   25   to feel comfortable to read the page-and-a-half     15:27:54

Page 122

    1   document that he's just put in front of you before  15:27:57
    2   answering his question.
    3       THE WITNESS: Okay.  I'll read it.
    4       MR. FERRALL: Actually, no, I would like
    5   him to answer the question.                         15:28:03
    6       Q  Are you telling me you can't tell me
    7   whether you sent the email?
    8       MR. NEUKOM: It's a totally unfair
    9   question.  The email that he sent would necessarily
   10   include everything that follows.                    15:28:10
   11       If you want him to tell you whether he
   12   remembers this or whether he sent it, let him read
   13   the document.  Come on, Brian.
   14       It's a page and a half.  We're not talking
   15   about him wasting 30 minutes to read a product      15:28:20
   16   manual.  It's a page-and-a-half email.  The witness
   17   has said he wants to read it, and we're going to let
   18   him read it.
   19       THE WITNESS: Okay.  I've read it.
   20   BY MR. FERRALL:                                     15:29:28
   21       Q  Okay.  Did you send this email that's
   22   dated December 11, 2008, at 10:14 p.m.?
   23       A  I believe I did.
   24       Q  Okay.  And in the last paragraph of that
   25   email, you write, "The percent sign leading a       15:29:41

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    1   message indicates that you are looking at an error  15:29:49
    2   message.  An ancient operating system called TOPS-20
    3   used such a convention and I adopted it."
    4       Do you see that?
    5       A  Yeah, I do see that.                         15:29:59
    6       Q  Why did you adopt a TOPS-20 convention?
    7       A  Of the possibilities that I had, that
    8   seemed -- that seemed a reasonable -- to me, it
    9   seemed like a reasonable way of doing things.
   10       Q  Did you get permission from Digital         15:30:32
   11   Equipment Company to use that convention?
   12       MR. NEUKOM: Objection.  Calls for a legal
   13   conclusion and misstates prior testimony.
   14       THE WITNESS: No, I did not seek
   15   permission.                                         15:30:55
   16   BY MR. FERRALL:
   17       Q  Have you ever heard of the acronym RIP in
   18   the context of networking?
   19       A  It typically means routing information
   20   protocol.                                           15:31:18
   21       Q  You're familiar with that protocol?
   22       A  It's been a while, but yes, I'm familiar
   23   with it.
   24       Q  Did you make up the acronym RIP for
   25   routing information protocol?                       15:31:32

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    1       A  No, I did not make up that acronym.         15:31:37
    2       Q  Did you make up the term "routing
    3   information protocol"?
    4       A  No.
    5       Q  Did you submit an RFC for the routing       15:31:51
    6   information protocol?
    7       A  No.
    8       Q  Do you know who did?
    9       A  No, I don't know who did.
   10       Q  Did you ever ask permission from the        15:32:25
   11   person who made up the term "RIP" for permission to
   12   use it, to use that term?
   13       MR. NEUKOM: Objection.  Foundation,
   14   vague, and calls for a legal conclusion.
   15       THE WITNESS: There was no one whose           15:32:50
   16   permission one could ask.
   17   BY MR. FERRALL:
   18       Q  Well, I'll tell you, a Mr. Charles Hedrick
   19   at Rutgers submitted what I believe to be the first
   20   RFC on the routing information protocol.            15:33:05
   21       Do you know Mr. Hedrick?
   22       A  I do.
   23       Q  Did you ever ask him for permission to use
   24   the term "RIP"?
   25       MR. NEUKOM: Objection.  Asked and            15:33:15

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Pages 122 to 125

1   answered.                          15:33:15
2        THE WITNESS: Mr. Hedrick formally
3   documented an informal standard that was already in
4   use in the industry for a number of years.
5   BY MR. FERRALL:                    15:33:27
6        Q  And what's the significance of that?
7        MR. NEUKOM: Objection. Calls for
8   speculation.
9        THE WITNESS: It wouldn't have occurred to
10  me to ask him for permission.      15:33:47
11  BY MR. FERRALL:
12       Q  I think you testified earlier that you
13  submitted several RFCs for the border gateway
14  protocol, correct?
15       A  Correct.                    15:34:07
16       Q  And your co-author on at least the first
17  such RFC was a Mr. Yakov Rekhter, correct?
18       A  Correct.
19       Q  Was he your co-author on the subsequent
20  submissions, too, do you know?      15:34:31
21       A  Certainly on the second one. I don't
22  recall on the third one. And after that, there were
23  other co-authors.
24       Q  And where does Mr. Rekhter or did
25  Mr. Rekhter work at the time?       15:34:50

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1   MR. NEUKOM: Objection. Compound, vague.    15:37:00
2        THE WITNESS: -- we did not make any such
3   assertions.
4        MR. NEUKOM: And foundation.
5   BY MR. FERRALL:                    15:37:08
6        Q  Did you ever have an agreement with
7   Mr. Rekhter about the right to use any of his
8   contributions to the BGP work that you guys did?
9        MR. NEUKOM: Vague, compound, calls for a
10  legal conclusion --                15:37:44
11       THE WITNESS: Could you --
12       MR. NEUKOM: -- and mischaracterizes prior
13  testimony.
14       THE WITNESS: Could you repeat the
15  question, please?                  15:37:59
16  BY MR. FERRALL:
17       Q  Sure. I'll ask a slightly different
18  question.
19       Did you ever ask permission from
20  Mr. Rekhter to use any of his contributions to the    15:38:09
21  BGP project?
22       MR. NEUKOM: Objection. Vague, compound,
23  calls for a legal conclusion.
24       THE WITNESS: We did not seek permission
25  from one another for our individual contributions.    15:38:26

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1        A  He worked for IBM.          15:34:52
2        Q  What was Mr. Rekhter's contribution to the
3   BGP RFC? The first one?
4        A  We were co-designers.
5        Q  Are you able to describe what he    15:35:28
6   contributed as opposed to what you contributed?
7        A  No. We worked closely together.
8        Q  Do you know whether you ever made any
9   declarations to the IETF concerning copyrights that
10  Cisco claimed in any of the language in the first    15:35:57
11  BGP RFC?
12       MR. NEUKOM: Objection. Vague, compound.
13       THE WITNESS: To the best of my
14  recollection, we made no copyright claims in the
15  first BGP RFC.                     15:36:17
16  BY MR. FERRALL:
17       Q  Did Cisco make any disclosures to the IETF
18  regarding copyright claims in any of the BGP RFCs?
19       MR. NEUKOM: Objection. Compound, vague.
20       THE WITNESS: Not to my knowledge.    15:36:35
21  BY MR. FERRALL:
22       Q  Did you ever make a disclosure to the
23  Internet Architecture Board of any intellectual
24  property rights in BGP, to your knowledge?
25       A  To my knowledge --           15:36:57

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1   BY MR. FERRALL:                    15:38:30
2        Q  Okay. IBM didn't ask you for permission,
3   either, correct?
4        A  No.
5        Q  One of the CLI terms in this case is the    15:39:20
6   term "IP address."
7        Are you familiar with that?
8        A  I'm familiar with the command expression
9   "IP address."
10       Q  Did you come up with the phrase "IP    15:39:33
11  address"?
12       A  When Cisco came out of Stanford, we were
13  shipping an IP -- an Internet protocol only router.
14  And there was a command "address" that took some
15  arguments.                         15:40:12
16       And after -- after a while, we started
17  adding other protocols to the software. The first
18  one was "DECnet." And since "address" was already
19  taken to refer to IP functionality, Internet
20  protocol functionality, we came up with "DECnet    15:40:44
21  address," and then had a DECnet address after it.
22       That "DECnet address" command could have
23  very well have said "address," and then DECnet
24  addresses look different than IP addresses, and we
25  could have had the software figure out which type of    15:41:11

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| | |
|---|---|
| 1    address we were referring to. But we chose "DECnet   15:41:13 | 1    referring to?                                    15:44:36 |
| 2    address." | 2        A    That was the aesthetic choice I made. |
| 3        It became clear that much more -- that we | 3        MR. NEUKOM: Objection. Mischaracterizes |
| 4    were becoming a multi-protocol router. We were | 4    prior testimony. |
| 5    adding other protocols into the box, into the   15:41:27 | 5        THE WITNESS: There were many possible   15:44:49 |
| 6    software. | 6    ways of doing it. As I indicated, I could perhaps |
| 7        And I had -- I value -- I value the | 7    take a look at an address and then infer what it |
| 8    aesthetic of having a symmetric-looking command line | 8    was. But that was not the choice that I made at the |
| 9    expression, symmetric hierarchy. It was clear we | 9    time. |
| 10    were heading towards a hierarchy.    15:41:52 | 10    BY MR. FERRALL:                               15:45:07 |
| 11        So at some point after DECnet and perhaps | 11        Q    What were the alternative commands that |
| 12    a few other protocols to make things look very | 12    you considered for "IP host"? |
| 13    similar, we started prefacing our IP-only commands | 13        A    "Name." "Name" was certainly one of the |
| 14    with "IP." And that gave a very -- what I thought | 14    possible candidates. "Network system" or |
| 15    was a very elegant, symmetric, elegant way of   15:42:16 | 15    "system" -- there are many, many words that one   15:45:5 |
| 16    referring to different protocols within a | 16    could use to refer to all sorts of different things. |
| 17    multi-protocol router. | 17        Q    Okay. But now you're talking about |
| 18        So that is the history of the "IP address" | 18    alternatives for the word "host," right? |
| 19    command. | 19        A    Um-hum. |
| 20        Q    Okay. My question was simpler. I   15:42:36 | 20        Q    Okay. You didn't -- you're not the first   15:46:08 |
| 21    appreciate that answer. But my question was a | 21    one to use the word "host," are you? |
| 22    little simpler than that, but let me ask it a | 22        A    No. |
| 23    different way. | 23        Q    I mean, "host" had been used for -- well |
| 24        You had heard of the term "IP address" | 24    before you joined Cisco to refer to a computer host. |
| 25    before you joined Cisco, hadn't you?   15:42:51 | 25    It's a conventional term, right?   15:46:29 |
| Page  130 | Page  132 |

| | |
|---|---|
| 1        MR. NEUKOM: Objection. Vague and asked   15:42:59 | 1        MR NEUKOM: Objection  Vague, compound,   15:46:31 |
| 2    and answered. | 2    foundation, and calls for opinion testimony |
| 3        THE WITNESS: I suppose I had. When one | 3        THE WITNESS: It was one of the |
| 4    is talking about different networking protocols, one | 4    possibilities that I had -- that I had |
| 5    needs to clarify which networking protocol one is   15:43:10 | 5    BY MR  FERRALL:                               15:46:46 |
| 6    talking about. So it was probably terminology that | 6        Q    And "host" was the term that was used in |
| 7    was in the air. | 7    the commands in the software that came from |
| 8    BY MR. FERRALL: | 8    Stanford; is that right? |
| 9        Q    Does the same go for "IP host," also? You | 9        MR. NEUKOM: Objection  Mischaracterizes |
| 10    had heard that before you joined Cisco?   15:43:29 | 10    prior testimony                               15:47:13 |
| 11        MR. NEUKOM: Objection. Misstates prior | 11        THE WITNESS: I had implemented the "host" |
| 12    testimony. | 12    command while I was at Stanford |
| 13        THE WITNESS: The original form of the | 13    BY MR FERRALL: |
| 14    "host" command was just "host command." It was | 14        Q    Okay. And what did you -- so did you |
| 15    another one that had to distinguish, in a   15:43:41 | 15    decide to use the word "host" for the command on the   15:47:27 |
| 16    multi-protocol world, in a multi-protocol piece of | 16    software you worked at while you were employed by |
| 17    software, what you were talking about. | 17    Stanford? |
| 18        It would have looked very odd in a | 18        MR NEUKOM: Objection  Vague |
| 19    multi-protocol router that there was one protocol | 19        THE WITNESS: Could you restate that |
| 20    that wasn't prefaced by a -- some descriptive   15:44:03 | 20    question?                               15:47:50 |
| 21    keyword. | 21    BY MR  FERRALL: |
| 22    BY MR. FERRALL: | 22        Q    Sure. |
| 23        Q    Following up on that, the purpose of your | 23        For the software that -- strike that. |
| 24    use of "IP" as the first keyword in that command "IP | 24        For the gateway TIP software that you |
| 25    host" was to distinguish the protocol that it's   15:44:33 | 25    worked on while you were employed at Stanford, was   15:48:02 |
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| | |
|---|---|
| 1  interface, and it would -- as a packet that was          16:12:12 | 1  the like, or "database lookup" or                    16:16:59 |
| 2  being sent -- sent out that interface, it could | 2  BY MR FERRALL: |
| 3  either be permitted or denied going through that | 3      Q  Did you coin the term "domain lookup"? |
| 4  interface. | 4      A  I decided to use that as a command |
| 5      Those were the two original uses of the        16:12:29 | 5  expression within the software, yes              16:17:21 |
| 6  "access list" command expression. | 6      Q  I'll ask the question one more time.  I'm |
| 7      Q  Do you believe that you coined the term | 7  asking you if you coined the term "domain lookup." |
| 8  "access list"? | 8      MR NEUKOM:  Objection  Asked and |
| 9      A  It was my choice to use that description. | 9  answered and vague |
| 10     Q  Well, I'm asking you if you coined that     16:12:56 | 10     THE WITNESS:  I did not                    16:17:43 |
| 11  term, or had you ever heard that term before in the | 11  BY MR  FERRALL: |
| 12  context of networking? | 12     Q  Do you know who did? |
| 13     MR. NEUKOM:  Objection.  Vague, compound, | 13     A  No idea |
| 14  asked and answered. | 14     Q  When was -- to your knowledge, when was |
| 15     THE WITNESS:  I do not believe that I had    16:13:13 | 15  the term "routing" ever used in conjunction with the    16:18:41 |
| 16  heard the term before. | 16  Internet protocol? |
| 17  BY MR. FERRALL: | 17     MR NEUKOM:  Objection  Vague and |
| 18     Q  Had you heard the term "IP access group" | 18  foundation |
| 19  before? | 19     THE WITNESS:  I don't know when the term |
| 20     A  Yes.                                 16:13:25 | 20  "routing" was used                           16:19:05 |
| 21     Q  Who coined that term, to your knowledge, | 21  BY MR  FERRALL: |
| 22  do you know? | 22     Q  Were people in the field talking about |
| 23     A  I did. | 23  routing in connection with IP before you joined |
| 24     Q  Under what circumstances?  Or for what | 24  Cisco? |
| 25  purpose, I should say?                     16:13:39 | 25     MR NEUKOM:  Objection  Vague, compound     16:19:24 |
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| 1      A  I don't remember the exact details, but it    16:13:52 | 1      THE WITNESS:  Yes                         16:19:27 |
| 2  is -- either assigns an access list to an interface | 2  BY MR FERRALL: |
| 3  or -- I think it assigns an interface to a -- an | 3      Q  Tell me what, if anything, was creative |
| 4  access list to an interface.  I believe it's access | 4  about your decision to use the term "IP routing" as |
| 5  class or something like that that assigns it to an    16:14:07 | 5  a CLI command.                               16:19:51 |
| 6  interface or to a line number. | 6      MR NEUKOM:  Objection  Calls for opinion |
| 7      Q  The term "domain name" is not a term that | 7  testimony |
| 8  you made up, is it? | 8      THE WITNESS:  At Stanford where we had |
| 9      A  No, I didn't make -- I -- no, I did not. | 9  terminal servers and gateways in the same software, |
| 10     Q  "Domain name" is a term that goes back to    16:15:38 | 10  there were times when it was convenient -- just       16:20:26 |
| 11  the ARPANET, actually.  Are you aware of that? | 11  because something had multiple interfaces, it could |
| 12     MR. NEUKOM:  Objection.  Foundation. | 12  still perhaps be a terminal server  So I needed a |
| 13     THE WITNESS:  I would be unsurprised if it | 13  way of turning off, disabling routing functionality |
| 14  went back that far. | 14     And I used the command -- I chose the |
| 15     Are you referring to ARPANET protocols or    16:16:02 | 15  keyword -- configuration keyword command expression    16:21:07 |
| 16  ARPANET network? | 16  "routing "  Then "no routing" would turn off routing |
| 17  BY MR. FERRALL: | 17  functionality in whatever software was running at |
| 18     Q  The ARPANET network. | 18  the time despite its hardware configuration |
| 19     A  I believe the concept was introduced while | 19     And then later on at Cisco, to keep the -- |
| 20  the ARPANET network was still running.       16:16:15 | 20  keep the form of the hierarchy of commands, we added    16:21:35 |
| 21     Q  What about the words "domain lookup"?  Did | 21  the -- we added our choice of -- we added "IP" in |
| 22  you coin that term "domain lookup"? | 22  front of it because you could potentially turn off |
| 23     MR. NEUKOM:  Objection.  Vague. | 23  other sorts of routing, or at least that was the -- |
| 24     THE WITNESS:  It's a parallel construction | 24  that was the -- that was a possibility for other |
| 25  to terms like "address lookup" or "host lookup" or    16:16:52 | 25  network protocols                           16:22:02 |
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 1    BY MR. FERRALL:                    17:55:19
 2       Q  Mr. Lougheed, this is a document that
 3    appears to be your work, according to the copyright
 4    notice on the front.
 5          Do you see that?                17:55:29
 6       A  Yes, I see that.
 7       Q  Okay.  Do you know when -- do you
 8    recognize it?
 9       A  Yes, I do.
10       Q  What is it?                    17:55:36
11       A  It's a file called "globs.h."  It is
12    declaring a set of variables that are used in the
13    software.
14       Q  And when did you compose what's
15    Exhibit 42?                          17:56:02
16       A  Is there a question?
17       Q  Yes.  I asked when did you compose
18    Exhibit 42?
19       A  Apparently June of 1985.
20       Q  And you were employed by Stanford at that    17:56:28
21    time, right?
22       A  Correct.
23       Q  We had talked earlier about the ARP,
24    address resolution protocol.
25          Do you remember that?              17:56:57
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 1    interior routing protocols.  And customer networks,    17:59:19
 2    especially in the early days when they were attached
 3    to the -- they had campus networks running one
 4    routing protocol, they'd be attached to the NSFNET
 5    backbone as well running a different routing         17:59:39
 6    protocol.
 7          And since routing protocols would give
 8    incommensurate metrics, metrics that could not be
 9    compared, I developed a concept of distance that
10    says if one routing protocol says it knows a route    18:00:08
11    to one destination and another routing protocol says
12    it knows a route to that same destination, which --
13    the routing protocol with the smallest
14    administrative distance would be the one that would
15    be entered into the routing table.              18:00:24
16          And so that was the problem, and my
17    solution was the administrative distance mechanism
18    that I described.
19          And when I implemented BGP, that was a
20    natural extension to include for BGP as well to be    18:00:49
21    able to configure an administrative distance to
22    determine the believability of BGP.
23          If no routing protocol -- if only one
24    routing protocol knew the destination, you would
25    believe that.  If there are two or more,            18:01:10
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 1       A  Yes.                          17:56:58
 2       Q  Okay.
 3       A  I remember you asked questions about that.
 4       Q  Are you familiar with there being a
 5    provision for time-outs in the ARP protocol?        17:57:15
 6          MR. NEUKOM:  Objection.  Vague and
 7    compound.
 8          THE WITNESS:  There is the -- ARP entries
 9    can become stale.  If you unplug the computer or you
10    move the computer somewhere else or you replace the    17:57:43
11    network interface, entries will become stale.
12    Implementing a time-out is a way of making sure the
13    cache isn't stale.
14    BY MR. FERRALL:
15       Q  Are you aware of there being a provision    17:58:10
16    for time-outs in the RFC for ARP?
17          MR. NEUKOM:  Objection.  Vague and
18    compound, asked and answered.
19          THE WITNESS:  I'm not -- I don't remember
20    such language right now.                    17:58:38
21    BY MR. FERRALL:
22       Q  Did you create the term "distance BGP"?
23       A  Yes.
24       Q  How did you come up with that term?
25       A  The Cisco IOS started supporting multiple    17:59:11
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 1    administrative distance was the tie-breaker.          18:01:16
 2       Q  Sorry.  I'm going to jump back to ARP.
 3          There's a term you use associated with
 4    ARP, "ARP cache."  We talked about that earlier in
 5    looking at one of the "clear" commands, right?        18:01:52
 6          Where did the term "ARP cache" come from?
 7       A  The cache is a -- logically a list of
 8    items.  An ARP cache would be a list of ARP requests
 9    that have been satisfied, including their MAC
10    addresses and how long since the last time we'd seen    18:02:37
11    a -- the router had seen an ARP request go by for
12    that particular source address.
13          That sort of computer science concept of a
14    cache is found all over.
15       Q  One of the commands that is indicated that    18:03:14
16    you authored is the command "boot system."
17          Had you ever heard someone use the words
18    "boot system" together before you joined Cisco?
19          MR. NEUKOM:  Objection.  Vague.
20          THE WITNESS:  I had heard phrases like      18:03:45
21    "boot the system up," "reboot the system," "reload
22    the system," "start the system," "restart the
23    system."
24          (Exhibit 43 was marked for identification
25          and is attached hereto.)              16:48:10
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| | |
|---|---|
| 1   Q  How did you choose the term -- the words   18:13:39 | 1 |
| 2   "timers basic" for this function? | 2 |
| 3      A  I don't remember where "basic" came from. | 3 |
| 4   But using the keyword "timers" was my -- was my | 4 |
| 5   introduction, was my creation.                    18:14:00 | 5 |
| 6         MR. NEUKOM:  Counsel, I believe we're now | 6 |
| 7   beyond seven hours. | 7 |
| 8         MR. FERRALL:  Okay.  Well, I -- given | 8         I, KIRK LOUGHEED, do hereby declare under |
| 9   Mr. Lougheed's tenure at Cisco, I thank him for his | 9   penalty of perjury that I have read the foregoing |
| 10   time, but I will say I think we deserve some more   18:14:22 | 10   transcript; that I have made any corrections as |
| 11   time with him. | 11   appear noted, in ink, initialed by me, or attached |
| 12         But I understand seven hours is up and | 12   hereto; that my testimony as contained herein, as |
| 13   you're going to say enough is enough for today I | 13   corrected, is true and correct. |
| 14   take it; is that right? | 14         EXECUTED this _____ day of _____, |
| 15         MR. NEUKOM:  Certainly for today for the   18:14:31 | 15   2015, at _____, _____ |
| 16   sake of the witness.  And we will respectfully | 16         (City)            (State) |
| 17   disagree with the idea that counsel needs more than | 17 |
| 18   seven hours -- | 18 |
| 19         MR. FERRALL:  Okay. | 19 |
| 20         MR. NEUKOM:  -- needs more than today.   18:14:41 | 20         KIRK LOUGHEED |
| 21   But we can discuss that for another day. | 21 |
| 22         In the meantime, I should note for the | 22 |
| 23   record the witness reserves the right to review the | 23 |
| 24   transcript and make corrections. | 24 |
| 25         Brian, I'm not sure I did that for   18:14:51 | 25 |
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| | |
|---|---|
| 1   Mr. Tjong.  If you're okay with it, I'd like to just   18:14:53 | 1         I, the undersigned, a Certified Shorthand |
| 2   do a stipulation across the case that both sides | 2   Reporter of the State of California, do hereby |
| 3   have the 30-day review and errata right for all | 3   certify: |
| 4   transcripts regardless whether counsel puts it on | 4         That the foregoing proceedings were taken |
| 5   the record at the depo as a two-way street.   18:15:04 | 5   before me at the time and place herein set forth; |
| 6         MR. FERRALL:  That's fine.  I thought it | 6   that any witnesses in the foregoing proceedings, |
| 7   existed as a matter of procedure anyway.  So that's | 7   prior to testifying, were administered an oath; that |
| 8   fine. | 8   a record of the proceedings was made by me using |
| 9         MR. NEUKOM:  I hope you're right, but glad | 9   machine shorthand which was thereafter transcribed |
| 10   to have the stipulation, even if it's unnecessary.   18:15:17 | 10   under my direction; that the foregoing transcript is |
| 11         MR. FERRALL:  Okay. | 11   a true record of the testimony given. |
| 12         MR. NEUKOM:  Thanks very much. | 12         Further, that if the foregoing pertains to |
| 13         THE VIDEO OPERATOR:  This concludes | 13   the original transcript of a deposition in a Federal |
| 14   today's videotaped deposition of Mr. Kirk Lougheed. | 14   Case, before completion of the proceedings, review |
| 15   We're off the record at 6:15 p.m.  Thank you.   18:15:25 | 15   of the transcript [X] was [ ] was not requested. |
| 16         (TIME NOTED:  6:15 p.m.) | 16         I further certify I am neither financially |
| 17         --o0o-- | 17   interested in the action nor a relative or employee |
| 18 | 18   of any attorney or any party to this action. |
| 19 | 19         IN WITNESS WHEREOF, I have this date |
| 20 | 20   subscribed my name. |
| 21 | 21 |
| 22 | 22   Dated: 11/25/2015 |
| 23 | 23 |
| 24 | 24         <%signature%> |
| 25 | 25         CARLA SOARES |
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HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

1              UNITED STATES DISTRICT COURT

2            NORTHERN DISTRICT OF CALIFORNIA

3                  SAN JOSE DIVISION

4

   CISCO SYSTEMS, INC.        Case No.: 5:14-cv-05344-BLF(PSG)

5

6                   Plaintiff,

       v.

7

   ARISTA NETWORKS, INC.

8

                    Defendants.

9    _____

10

11

12

13      * HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY *

14       VIDEOTAPED DEPOSITION OF KIRK LOUGHEED

15               Palo Alto, California

16             Monday, April 4, 2016

17                   Volume 2

18

19

20

21   Reported by:

22   LESLIE JOHNSON

23   RPR, CSR No. 11451

24   Job No.: 2285024

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| | |
|---|---|
| 1    UNITED STATES DISTRICT COURT | 1    I N D E X |
| 2  FOR THE NORTHERN DISTRICT OF CALIFORNIA | 2 |
| 3    SAN JOSE DIVISION | 3 WITNESS       EXAMINATION |
| 4 | 4 KIRK LOUGHEED |
|    CISCO SYSTEMS, INC   Case No : 5:14-cv-05344-BLF(PSG) |    Volume 2 |
| 5 | 5 |
|      Plaintiff, | 6    BY MR. WONG      197 |
| 6 | 7 |
|    v | 8    EXHIBITS |
| 7 | 9   KIRK LOUGHEED |
|    ARISTA NETWORKS, INC | 10 NUMBER   DESCRIPTION    PAGE |
| 8 | 11 Exhibit 452  Copy of name badge; 1 page   198 |
|     Defendants | 12 Exhibit 453  Black and white copy of photograph;  198 |
| 9 _____ |       1 page |
| 10 | 13 |
| 11 |     Exhibit 454  Patent Agreement; Bates stamped   208 |
| 12 | 14    KL-00000872 to 891 |
| 13 | 15 Exhibit 455  A Multiple Protocol Kernel for   228 |
| 14   * HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY * |     Local Area Network Software |
| 15 | 16    Development Reference Manual; Bates |
| 16 |     stamped KL-00000001 to 93 |
| 17   VIDEOTAPED DEPOSITION OF KIRK LOUGHEED, Volume 2, | 17 |
| 18 taken on behalf of Defendant, at 601 California Avenue, |     Exhibit 456  Document entitled "Chaosnet"; Bates  238 |
| 19 Palo Alto, California, beginning at 9:25 a m and ending | 18    stamped KL-00000186 to 250 |
| 20 at 4:37 p m , on Monday, April 4, 2016, before | 19 Exhibit 457  Document entitled "Debugging   241 |
| 21 LESLIE JOHNSON, Certified Shorthand Reporter No  11451 |     Information"; Bates stamped |
| 22 | 20    KL-00000564-654 |
| 23 | 21 Exhibit 458  DECnet Digital Network Architecture  244 |
| 24 |     (Phase V); Bates stamped |
| 25 | 22    KL-00000251 to 380 |
|                Page 191 | 23 Exhibit 459  E-mail from Stanford Low Overhead  252 |
| |     Timesharing; Bates stamped |
| | 24    KL-00001699 to 763 |
| | 25 |
| |                Page 193 |

| | |
|---|---|
| 1 APPEARANCES: | 1    EXHIBITS (Cont ) |
| 2 | 2    KIRK LOUGHEED |
| 3 FOR PLAINTIFF CISCO SYSTEMS, INC.: | 3 NUMBER   DESCRIPTION    PAGE |
| 4   QUINN EMANUEL URQUHART & SULLIVAN LLP | 4 Exhibit 460  E-mail dated 10-Jan-83 from Barb   260 |
| 5   BY: JOHN (JAY) NEUKOM, ESQ. |     at ISL to Computer Committee; Bates |
| 6   50 California Street, 22nd Floor | 5    stamped KL-00000868 to 871 |
| 7   San Francisco, California  94111 | 6 Exhibit 461  Stanford Ethertip/Gateway User and  263 |
| 8   (415)875-6600 |     Configuration Guide; Bates stamped |
| 9   johnneukom@quinnemanuel.com | 7    CSI-CLI-01315367 to 97 |
| 10 FOR DEFENDANT ARISTA NETWORKS, INC.: | 8 Exhibit 462  Letter dated August 21, 1986 from  281 |
| 11   KEKER & VAN NEST LLP |     Robert L  Street to Len Bosack; |
| 12   BY: RYAN WONG, ESQ. | 9    Bates stamped CSI-CLI-01839502 |
| 13   633 Battery Street |     to 504 |
| 14   San Francisco, California  94111 | 10 |
| 15   (415)391-5400 |     Exhibit 463  E-mail dated 4/3/2006 from Kirk   298 |
| 16   rwong@kvn.com | 11    Lougheed to Vivian Neou; Bates |
| 17 ALSO PRESENT: |     stamped CSI-CLI-01124245 |
| 18   SEAN GRANT, Videographer | 12 |
| 19 |     Exhibit 464  Cisco's Amended Exhibit F; 44 pages  302 |
| 20 | 13 |
| 21 |     Exhibit 465  Software Unit External Functional  310 |
| 22 | 14    Specification; Bates stamped |
| 23 |     CSI-CLI-00608751 to 752 |
| 24 | 15 |
| 25 |     Exhibit 466  ipsupport c -- miscellaneous IP   328 |
|                Page 192 | 16    support code; 20 pages |
| | 17 Exhibit 467  Document entitled "Part 3: Media  332 |
| |     Access Control (MAC) Bridges"; |
| | 18    Bates stamped ARISTANDCA00032440 |
| |     to 812 |
| | 19 |
| |     Exhibit 468  Contents of "lip" directory; 1 page  348 |
| | 20 |
| |     Exhibit 469  Commandl c -- ASM/AGS commands;   355 |
| | 21    Bates stamped KL-SC-00000001 to 9 |
| | 22 Exhibit 470  Config c -- parse and act upon   358 |
| |     configuration commands; Bates |
| | 23    stamped KL-SC-00000010 to 20 |
| | 24 Exhibit 471  Exec c -- ASM/AGS command level;   365 |
| |     Bates stamped KL-SC-00000021 to 32 |
| | 25 |
| |                Page 194 |

2 (Pages 191 - 194)

| | |
|---|---|
| 1          EXHIBITS (Cont.) | 1          THE VIDEOGRAPHER:  Thank you.  Will the |
| 2          KIRK LOUGHEED | 2  certified court reporter please swear in the |
| 3  NUMBER          DESCRIPTION          PAGE | 3  witness. |
| 4  Exhibit 472   "cisco.c" source code; 1 page      371 | 4 |
| 5  Exhibit 473   "stanford.c" source code; 1 page   371 | 5          KIRK LOUGHEED, |
| 6  Exhibit 474   Source code; Bates stamped      375 | 6  having been administered an oath, was examined and |
|          KL-SC-00000033 to 41 | 7          testified as follows: |
| 7 | 8 |
|   Exhibit 475   Source code; Bates stamped      375 | 9          EXAMINATION (RESUMED) |
| 8          KL-SC-00000042 to 52 | 10  BY MR. WONG: |
| 9  Exhibit 476   Cisco Systems ASM/AGS User Manual   383 | 11          Q.  Good morning, Mr. Lougheed. |
|          and Configuration Guide; Bates | 12          A.  Good morning. |
| 10          stamped CSI-CLI-00358622 to 54 | 13          Q.  Mr. Lougheed, do you understand that this |
| 11                    * * * | 14  is a continuation of your personal deposition that |
| 12 | 15  was taken back on November 20th, 2015? |
| 13 | 16          A.  I do. |
| 14 | 17          Q.  And do you understand that you are still |
| 15 | 18  testifying under oath as if you were testifying at |
| 16 | 19  trial? |
| 17 | 20          A.  I do. |
| 18 | 21          Q.  And is there any reason why you cannot |
| 19 | 22  give full and truthful testimony today? |
| 20 | 23          A.  There is no reason. |
| 21 | 24          Q.  And are you generally still familiar with |
| 22 | 25  the ground rules for a deposition? |
| 23 | |
| 24 | |
| 25 | |
|                              Page 195 |                              Page 197 |

| | |
|---|---|
| 1       Palo Alto, California, Monday, April 4, 2016 | 1          A.  Yes. |
| 2              9:25 a.m. | 2          Q.  Okay.  Well, I'll just repeat some of the |
| 3 | 3  more important rules.  If you need to take a break |
| 4          THE VIDEOGRAPHER:  Good morning.  We're on | 4  at any time, just let me know.  And all I'd ask is |
| 5  the record.  The time is 9:25 a.m., and the date is | 5  that if there is a question pending, that you answer |
| 6  April 4th, 2016.  This begins Volume 2 of the | 6  it before we go on the break.  Okay? |
| 7  videotaped deposition of Mr. Kirk Lougheed.  My name | 7          A.  (Witness nods head.) |
| 8  is Sean Grant, here with our court reporter, Leslie | 8          MR. WONG:  Why don't we mark this as the |
| 9  Johnson.  We're here from Veritext Legal Solutions | 9  first exhibit for today. |
| 10  at the request of counsel for Defendant.  This | 10          (Exhibit 452 marked for identification.) |
| 11  deposition is being held at Wilson Sonsini in Palo | 11          MR. WONG:  And we will mark this one as |
| 12  Alto, California.  The caption of this case is | 12  the next exhibit. |
| 13  "Cisco Systems Inc. versus Arista Networks Inc.," | 13          (Exhibit 453 marked for identification.) |
| 14  Case No. 5:14-cv-05344-BLF. | 14          MR. NEUKOM:  Ryan, I have two separate |
| 15          Please note that audio and video recording | 15  pieces of paper.  Are you treating these as two |
| 16  will take place unless all parties have agreed to go | 16  separate exhibits? |
| 17  off the record.  Microphones are sensitive and may | 17          MR. WONG:  Yes.  I'm going to give them |
| 18  pick up whispers, private conversations or cellular | 18  two exhibit numbers and read them into the record in |
| 19  interference. | 19  just a second. |
| 20          At this time, will counsel please identify | 20          The court reporter has marked as |
| 21  themselves and state whom they represent. | 21  Exhibit 452 a photocopy -- photo bearing Bates Nos. |
| 22          MR. WONG:  Ryan Wong from Keker & Van Nest | 22  KL-00002202.  The court reporter has also marked as |
| 23  for Defendant Arista Networks. | 23  Exhibit 453, a black and white photo with Bates Nos. |
| 24          MR. NEUKOM:  John Neukom for the plaintiff | 24  KL-00002201. |
| 25  and also today for the witness. | 25  / / / / |
|                              Page 196 |                              Page 198 |

3 (Pages 195 - 198)

HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

1    A.   A type of computer manufactured by the
2  Digital Equipment Corporation.
3    Q.   And Digital Equipment Corporation is also
4  known as DEC, right?
5    A.   Correct.
6    Q.   And did you work with these DEC VAX
7  super-minicomputers while an employee at Stanford?
8    A.   One of the -- actually, at least two of
9  the systems programmers were the ones that were
10 primarily responsible for making sure that those
11 systems ran properly.
12   Q.   Was Mr. Satz one of those systems
13 programmers that --
14   A.   Yes.
15   Q.   -- worked with the VAX system?
16   A.   Yes.
17   Q.   Is the answer the same for the VAX-11/750
18 super-minicomputers?
19   A.   Yes.
20   Q.   Did those VAX machines have a command-line
21 interface?
22       MR. NEUKOM:  Objection.  Vague.
23 BY MR. WONG:
24   Q.   Did the VAX-11/780 systems have a
25 command-line interface?

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1    Q.   And the first full sentence of that bullet
2  point says, "Supervised a computer science
3  department electronics design engineer in the
4  hardware debugging of a DEC-20 to ethernet
5  interface."
6        The next sentence says, "I also wrote the
7  interface's control microcode, the hardware
8  diagnostics, and the operating system support for
9  the device."
10       Do you see that?
11   A.   I do.
12   Q.   Is that referring to the EtherTIP
13 software?
14   A.   No.
15   Q.   What is that referring to?
16   A.   That's referring to the Massbus-Ethernet
17 Interface Subsystem.
18   Q.   And that's also reflected with the acronym
19 MEIS, correct?
20   A.   Yes.
21   Q.   Did Cisco use any of the software for the
22 MEIS?
23   A.   No.
24   Q.   Can you go to the page ending with Bates
25 No. 888 in Exhibit 454.

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1        MR. NEUKOM:  Objection.  Vague.
2        THE WITNESS:  Yes.
3  BY MR. WONG:
4    Q.   Were you familiar with how the VAX
5  command-line interface operated?
6    A.   VAX is the name of a piece of hardware
7  that would run an operating system.
8    Q.   Thank you.
9        What is the operating system that the VAX
10 hardware ran?
11   A.   At Stanford there were two possibilities,
12 something called VAX VMS, and there was also
13 Berkeley UNIX.
14   Q.   Is Berkeley UNIX the same as BSD?
15   A.   Yes.
16   Q.   Were you familiar with the VAX VMS
17 command-line interface?
18   A.   No.
19   Q.   Were you familiar with the Berkeley UNIX
20 command-line interface?
21   A.   Yes.
22   Q.   The last bullet point on the page ending
23 in 886 of Exhibit 454, do you see that?  It starts
24 with "Supervised a computer science department."
25   A.   Yes, I see that paragraph.

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1    A.   Uh-huh.  Yes.  I'm on that page.
2    Q.   The first bullet point, or I guess the
3  only bullet point on this page starts with "Acted as
4  Stanford contact."
5        Do you see that?
6    A.   Yes, I see that paragraph.
7    Q.   Is it true that you acted as Stanford
8  contact with DEC for field testing of two new
9  releases of the DEC-20 operating system?
10   A.   Let me finish the paragraph so I can
11 establish context.
12   Q.   Sure.  Please take your time.
13   A.   Okay.  I've read the paragraph.  Your
14 question is?
15   Q.   Is it true you that you acted as the
16 Stanford contact with Digital Equipment Corporation
17 for field testing two new releases of the DEC-20
18 operating system?
19   A.   Yes.
20   Q.   Is the DEC 20 operating system the same
21 thing as the TOPS-20 operating system?
22   A.   Yes.
23   Q.   Further down on this same page ending with
24 control numbers 888 on Exhibit 454, there's a
25 section called "Special Skills Knowledge or Training

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10 (Pages 223 - 226)

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| | |
|---|---|
| 1 Required Including Tools or Equipment Used."<br>2     Do you see that?<br>3   A. I see that.<br>4   Q. And one sentence underneath that heading<br>5 says "Familiarity with the hardware and protocols<br>6 used in local area networks in (ethernet) and<br>7 long-haul national networks (ARPANET)."<br>8     Do you see that?<br>9   A. I see that sentence.<br>10   Q. Did I read that correctly?<br>11   A. You did.<br>12   Q. What protocols were you familiar with as<br>13 of May 6th, 1985 that were used in local area<br>14 networks?<br>15   A. There -- ethernet, even in 1985 had many,<br>16 many protocols. You could run PUP or Park Universal<br>17 Packet. You could run PCPIP. You could run XNS.<br>18 You could run -- by that time, pretty much any<br>19 network protocol would run on an ethernet.<br>20   Q. Was address resolution protocol a protocol<br>21 that was used in local area networks?<br>22   A. On ethernets, yes.<br>23   Q. You can put that document aside.<br>24     MR. WONG: Let's mark this one as<br>25 Exhibit 455, please.<br><br>Page 227 | 1     MR. NEUKOM: Objection. The question is<br>2 phrased in the hypothetical.<br>3     MR. WONG: Let me rephrase the question so<br>4 it's not hypothetical.<br>5 BY MR. WONG:<br>6   Q. Did you obtain the document marked as<br>7 Exhibit 455 before you left Stanford in July of<br>8 1986?<br>9   A. I believe so.<br>10   Q. Do you remember if you obtained the<br>11 document marked as Exhibit 455 directly from<br>12 Mr. Yaeger?<br>13   A. I have no memory of now I actually<br>14 obtained this document.<br>15   Q. Were documents -- strike that.<br>16     Was the document marked as Exhibit 455<br>17 available for you to get, besides going directly<br>18 through Mr. Yaeger?<br>19     MR. NEUKOM: Objection. Vague.<br>20     THE WITNESS: I don't have a memory of how<br>21 I actually obtained it. I -- these -- such<br>22 documents were certainly easily obtainable at<br>23 Stanford University.<br>24 BY MR. WONG:<br>25   Q. When you say such documents like<br><br>Page 229 |
| 1     (Exhibit 455 marked for identification.)<br>2 BY MR. WONG:<br>3   Q. The court reporter has marked as<br>4 Exhibit 455 a document bearing control numbers KL<br>5 00000001 to 93.<br>6     Mr. Lougheed, do you recognize the<br>7 document marked as Exhibit 455?<br>8   A. I recognize what it is. I don't believe I<br>9 have read it before.<br>10   Q. Okay. You say you recognize what it is.<br>11 What is the document marked as Exhibit 455?<br>12   A. It appears to be a reference manual for<br>13 Bill Yaeger's software that he developed under the<br>14 SUMEX project.<br>15   Q. And this was produced from your personal<br>16 files, correct, Exhibit 455?<br>17   A. Yes.<br>18   Q. Why did you have the document marked as<br>19 Exhibit 455 in your personal files?<br>20   A. It seemed to me to be of -- whenever I<br>21 obtained it, it seemed to me to be of at least<br>22 historical interest.<br>23   Q. Would you have obtained the document<br>24 marked as Exhibit 455 before you left Stanford in<br>25 July of 1986?<br><br>Page 228 | 1 Exhibit 455 were easily obtainable at Stanford<br>2 University, how were these documents easily<br>3 obtainable?<br>4   A. It was a community where -- it was a<br>5 research community where research reports, if you<br>6 wanted them, you could -- you could ask around for<br>7 them.<br>8   Q. Now, you said you weren't sure if you had<br>9 read the document marked as Exhibit 455, correct?<br>10   A. I have no --<br>11     MR. NEUKOM: Objection. Misstates prior<br>12 testimony.<br>13     THE WITNESS: I have no memory of reading<br>14 this before. I may have. I may not have. I have<br>15 no memory.<br>16 BY MR. WONG:<br>17   Q. Were you familiar with the functionality<br>18 of the SUMEX software that Mr. Yaeger wrote while at<br>19 Stanford?<br>20   A. Yes.<br>21   Q. Were you familiar with how the command<br>22 parser worked in the SUMEX software that Mr. Yaeger<br>23 wrote?<br>24   A. At one point I certainly was.<br>25   Q. Were you familiar with how the command<br><br>Page 230 |

11 (Pages 227 - 230)

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Case 5:14-cv-05344-BLF Document 612-7 Filed 11/08/16 Page 64 of 122
Case 5:14-cv-05344-BLF Document 512-8 Filed 09/06/16 Page 64 of 122
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1    Q.  And was Exhibit 456 a document that was in
2  your personal files?
3    A.  Yes, it was.
4    Q.  Okay.  And why did you have this CHAOS net
5  document marked as Exhibit 456 in your personal
6  files?
7    A.  Because in 1987, at the request of some
8  customers, we added CHAOS net to the Cisco router
9  software.  A consultant named Eric Weaver actually
10  did the -- I believe it was Eric Weaver did the
11  actual implementation in the Cisco software.  He was
12  a contractor for us.
13    Q.  Okay.  So your possession of the document
14  marked as Exhibit 456 was in connection with work
15  that Cisco did with respect to CHAOS net?
16    A.  Correct.  I suspect this was the document
17  I handed him to say I want this in the router.
18    Q.  Did you ever read the document marked as
19  Exhibit 456 before you handed it to Mr. Weaver?
20    A.  I may have.
21    Q.  Can you turn to page 17 of Exhibit 456.
22  The control number at the bottom ends in 206.  Let
23  me know when you're there, please.
24    A.  Okay.  I'm on page -- page 17 of the CHAOS
25  net document.

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1    Q.  Did you come up with the term "flow
2  control"?
3    A.  No.  You're doing a bit of random word
4  matching.
5    Q.  Yes.  Random questioning is definitely my
6  style.
7      You can set that document aside.
8      MR. WONG:  Let's mark this one as the next
9  exhibit, please.
10      (Exhibit 457 marked for identification.)
11  BY MR. WONG:
12    Q.  The court reporter has marked as
13  Exhibit 457 a document bearing control numbers
14  KL-00000564 to 654.
15      And Mr. Lougheed, take your time to look
16  at Exhibit 457.  But my question to you is, do you
17  recognize the document marked as Exhibit 457?
18    A.  There is no title to this document, other
19  than Chapter 1.  It appears to be -- have to do with
20  DEC-20 hardware.  So I don't -- I do not recognize
21  where this document came from.
22    Q.  Okay.  I'll represent to you that this
23  document was produced to us without a cover page.
24  So this is -- this is the document that was produced
25  to us.

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1    Q.  And the first -- strike that.  At the top
2  of this page ending in control numbers 206 of
3  Exhibit 456, it says "3.8 Flow and Error Control."
4      Do you see that?
5    A.  Yes.
6    Q.  Do you understand what flow control is,
7  Mr. Lougheed?
8    A.  In a general sense.
9    Q.  Can you please explain to me what flow
10  control means in a general sense.
11    A.  How you put packets onto the network and
12  what speed, rate that you -- and under what
13  conditions you put the packets onto the network.
14  That's my general understanding.  I'm not sure --
15  every protocol has its own nuances, so -- and I have
16  not read the rest of this page, so . . .
17    Q.  Understood.
18      When you say every protocol has its own
19  nuances, do you mean that every protocol has its own
20  nuances for flow control?
21    A.  Pretty much.
22    Q.  When was -- strike that.
23      Do you know when the term "flow control"
24  was first used in the networking industry?
25    A.  No.

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1      Do you have any doubt that this document
2  was in your personal files that you handed over to
3  Cisco's counsel?
4    A.  I don't doubt that.
5    Q.  Do you know when you came into possession
6  of the TOPS-20 document marked as Exhibit 457?
7    A.  Probably while I was working at Stanford,
8  if this indeed came from the contents of the boxes
9  in my garage.
10    Q.  Mr. Lougheed, did you give the documents
11  that were in your garage to your counsel after the
12  first deposition took place?
13    A.  There were -- yes.
14    Q.  Was there anything else besides documents
15  that were stored in your garage that you provided to
16  your counsel after the first deposition of you?
17  Anything besides paper documents that you found in
18  your garage?  Did you provide any other documents to
19  your counsel after your first deposition?
20    A.  Just paper documents.
21    Q.  Did you have -- strike that.
22      While you were working at Stanford and
23  before you left to join Cisco in July of 1986, did
24  you have TOPS-20 user manuals in your possession?
25      MR. NEUKOM:  Objection.  Vague.

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14 (Pages 239 - 242)

Case 5:14-cv-05344-BLF   Document 729-7   Filed 12/09/16   Page 66 of 123
Case 5:14-cv-05344-BLF   Document 612-7   Filed 11/08/16   Page 65 of 122
Case 5:14-cv-05344-BLF   Document 512-8   Filed 09/06/16   Page 65 of 122
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| | |
|---|---|
| 1   A.  Yes. | 1      Q.  And the Stanford low overhead |
| 2   Q.  Do you know when a spanning tree is? | 2  time-sharing, is that also -- does that also use the |
| 3   A.  Yes, I do. | 3  acronym LOTS? |
| 4   Q.  What is a spanning tree? | 4      A.  Yes. |
| 5   A.  A spanning tree is a -- | 5      Q.  If you turn to the first page of |
| 6      MR. NEUKOM:  Objection.  Calls for | 6  Exhibit 459, the Bates number ends in 1700.  Let me |
| 7  opinion. | 7  know when you're there. |
| 8      THE WITNESS:  It's a graph imposed on the | 8      A.  Okay. |
| 9  network to ensure that packets that are being | 9      Q.  There is a -- I guess this is an e-mail at |
| 10  bridged do not get into loops as they are being | 10  the top of the page ending in Bates Nos. 1700, |
| 11  transmitted by bridges. | 11  correct?  Is that an e-mail at the top of the page |
| 12  BY MR. WONG: | 12  ending in Bates No. 1700? |
| 13     Q.  And is that the function that is served by | 13     A.  Yeah. |
| 14  a spanning tree? | 14     Q.  And there's a CC there to b.bombadil?  Do |
| 15     MR. NEUKOM:  Objection.  Calls for opinion | 15  you see that? |
| 16  testimony, and the question is phrased in the | 16     A.  Right. |
| 17  hypothetical or abstract. | 17     Q.  Is that your e-mail address? |
| 18  BY MR. WONG: | 18     A.  That was my -- that was my user ID at the |
| 19     Q.  Let me ask the question differently, | 19  LOTS computer facility. |
| 20  Mr. Lougheed. | 20     Q.  Okay.  So where "b.bombadil" appears in |
| 21     What is the function served by a spanning | 21  Exhibit 459, that is your user ID, correct? |
| 22  tree? | 22     A.  Correct. |
| 23     MR. NEUKOM:  Same objections. | 23     Q.  What does the "B" stand for for the |
| 24     THE WITNESS:  The spanning tree is | 24  b.bombadil? |
| 25  essentially a data structure -- in effect is a data | 25     A.  So in the -- in 1976, when they set up the |
| Page 251 | Page 253 |

| | |
|---|---|
| 1  structure that allows bridges and other things that | 1  student computing facility, they needed to support |
| 2  forward at the MAC layer -- it tells them which | 2  several thousand users, and the operating system had |
| 3  ports they should not forward packets on. | 3  a limitation that it could only support some number |
| 4  BY MR. WONG: | 4  smaller than the total number of students.  So what |
| 5     Q.  When did first hear of the term "spanning | 5  they did was they created top level directories A |
| 6  tree"? | 6  through Z, and then the dot indicates that there is |
| 7     A.  During my -- during Cisco.  Probably late | 7  a subdirectory or, you know, a subuser of that.  So |
| 8  '80s. | 8  everybody's user ID had the initial letter, dot |
| 9     Q.  You can set that document aside. | 9  username. |
| 10     MR. WONG:  Let's have that marked as the | 10     Q.  Understood.  I was wondering why it wasn't |
| 11  next exhibit, please. | 11  T. Bombadil.  But I'm assuming the Bombidel refers |
| 12     (Exhibit 459 marked for identification.) | 12  to -- |
| 13  BY MR. WONG: | 13     A.  The Tolkien character. |
| 14     Q.  The court reporter has marked as | 14     Q.  Yes. |
| 15  Exhibit 459 a document bearing control numbers | 15     THE REPORTER:  To what character? |
| 16  KL-00001699 to 1763. | 16     THE WITNESS:  Tolkien.  As in Lord of the |
| 17     Mr. Lougheed, please take a moment to look | 17  Rings.  Or actually, as in the Hobbit.  No. |
| 18  at Exhibit 459 and let me know -- well, and my first | 18  Actually, it's Lord of the Rings. |
| 19  question to you will be, do you recognize | 19  BY MR. WONG: |
| 20  Exhibit 459? | 20     Q.  I think it's Lord of the Rings. |
| 21     A.  Yes. | 21     A.  What can I say?  I was an undergraduate. |
| 22     Q.  And what is Exhibit 459? | 22  I was stuck with that same username. |
| 23     A.  It's a computer listing of my e-mail while | 23     Q.  I would have chosen Radagast. |
| 24  I was working at the Stanford low overhead | 24     Are you aware of the e-mail alias at Cisco |
| 25  time-sharing. | 25  called Clueless@Cisco.com? |
| Page 252 | Page 254 |

17 (Pages 251 - 254)

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1  BY MR. WONG:
2     Q.  Can access lists be associated with
3  different routing protocols?
4     A.  Yes.
5        MR. NEUKOM:  Objection.  Calls for opinion
6  testimony.
7  BY MR. WONG:
8     Q.  Yes, right?
9     A.  We have implemented such in the past.
10    Q.  What other routing protocols have -- for
11 what -- strike that.
12       For what other routing protocols have you
13 implemented access lists?
14    A.  I'll have to think carefully about this.
15 XNS, Banyan VINES, I believe.  I'd have to go refer
16 to the Cisco documentation, but I know that we did
17 have access lists for a number of network protocols.
18       MR. WONG:  Just for the court reporter's
19 knowledge, did you say Banyan VINES?
20       THE WITNESS:  Banyan VINES.  B-A-N-Y-A-N,
21 and then VINES, as in --
22       MR. NEUKOM:  Red vines.
23       THE WITNESS:  As in red vines.  Okay.
24 BY MR. WONG:
25    Q.  As in a banyan tree?

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1     A.  A banyan tree.
2     Q.  So the "IP" word in the "ip access-group"
3  command is meant to indicate that the access groups
4  are for the IP protocol, correct?
5     A.  It is an indication that that command
6  applies to the IP -- into the IP hierarchy of the
7  interface command.
8     Q.  So if you were implementing access groups
9  for the XNS protocol, it would be "XNS
10 access-group," right?
11    A.  Yes.
12    Q.  Have you had -- strike that.
13       Did you come up with the term "access
14 group" in 1989?
15    A.  That was the command expression I chose.
16    Q.  Well, was it the first -- had you heard of
17 the term "access group" at the time that you added
18 this command to the Cisco IOS?
19    A.  No, I hadn't.  I had previously
20 implemented an "access class" command associated --
21 for associating an access list with a terminal line.
22 And I needed something to associate it with an
23 interface.  And I was -- I just needed something
24 different.  And that was the best I could come up
25 with that day.

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1     Q.  When you added the "ip access-group"
2  command, did you consider using a different term
3  other than "IP"?
4     A.  I do not recall whether we had switched
5  everything to the IP's hierarchy then.  I'd have to
6  refer to the documentation to see whether or not we
7  actually had an IP hierarchy or whether we assumed
8  everything was IP.
9     Q.  I understand.  If there had been an IP
10 hierarchy already implemented at the time you added
11 the "ip access-group" command would you have
12 considered any other term besides "IP" in the "ip
13 access-group" command?
14       MR. NEUKOM:  Objection.  Calls for
15 speculation, and the question poses a hypothetical.
16       THE WITNESS:  I could have perhaps
17 inverted the hierarchy.  I'm sorry.  The question is
18 again?
19 BY MR. WONG:
20    Q.  You testified that you weren't sure
21 whether or not there had been an IP hierarchy
22 implemented at the time you added this "ip
23 access-group" command?
24    A.  Right.
25    Q.  Assuming you checked and there was already

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1  an IP hierarchy in existence when you added the "ip
2  access-group" command, would you have changed the
3  first word to be anything other than "IP"?
4     A.  Given that I had made the -- made the
5  choice of "IP" as the keyword indicating Internet
6  protocol-related stuff, I would have felt
7  constrained to use that as the leading keyword.
8  Otherwise, it would be a seemingly asymmetric
9  construction in the hierarchy.
10    Q.  How long did it take you to come up with
11 the ""ip access-group"" command syntax?
12    A.  Not very long.  All I needed was some sort
13 of keyword that had "access" in it and something
14 after it to distinguish it between class and list.
15 And as I said earlier, that was the best I could
16 come up with that day.  I wasn't necessarily
17 terribly happy about it.  It was not a terribly
18 descriptive command, as far as I was concerned.
19    Q.  When you say "not very long," are you
20 talking about a matter of minutes?
21    A.  Yep.
22    Q.  How long -- did you write the source code
23 for the "ip access-group" command?
24    A.  For the original, yes.
25    Q.  How long did it take you to write the

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33 (Pages 315 - 318)

1 source code for the original "ip access-group"
2 command?
3     A.  So writing it for that command would have
4 been part of writing the entire functionality of
5 putting access lists onto interfaces, I guess on the
6 order of a day.
7     Q.  If you turn to page 20 on Exhibit 464.
8 Let me know when you're there.
9     A.  Okay.  I'm on page 20.
10     Q.  The second to the top command is
11 "mac-address."
12         Do you see that?
13     A.  Uh-huh.
14     Q.  Are you the originator of the
15 "mac-address" command?
16     A.  Yes.
17     Q.  How do you know that you're the originator
18 of the "mac-address" command?
19     A.  I remember the problem that I was solving
20 that I needed that sort of functionality.
21     Q.  What was the problem that you were trying
22 to solve by the "mac-address" command?
23     A.  I needed to send packets on a serial line
24 that actually -- which a serial line does not have
25 MAC addresses, but I needed to somehow get a MAC

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1     But to your knowledge, MAC is an
2 industry-standard term defined either on OSI or the
3 IEEE?
4         MR. NEUKOM:  Objection.  Vague.  Calls for
5 opinion.
6 BY MR. WONG:
7     Q.  Correct?
8     A.  I believe at least IEEE has used the term
9 "MAC address."
10     Q.  And at the time that you added the
11 "mac-address" command to Cisco IOS, had the IEEE, to
12 your knowledge, already started using the term "MAC
13 address"?
14     A.  Yes.
15     Q.  How long did it take you -- strike that.
16         How long did it take you to come up with
17 the syntax for the "mac-address" command?
18     A.  I don't remember how long.  I suspect it
19 was less than a day.
20     Q.  Why do you say that?
21     A.  I tend to make decisions quickly.
22     Q.  How long did it take you to write the
23 source code for the functionality associated with
24 the "mac-address" command?
25     A.  It was probably the same day.

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1 address associated with that particular serial line.
2     Q.  Was that related to a client request?
3     A.  Yes.  I don't remember the exact customer
4 or the details to it.
5     Q.  Do you remember if the customer suggested
6 you calling the command "mac-address"?
7     A.  I don't remember if the customer suggested
8 anything in that particular -- in that particular
9 instance.
10     Q.  And is the function of the "mac-address"
11 command to associate a MAC address with a particular
12 serial line?
13     A.  It could be a serial line.  It could be
14 actually any interface.  It would depend what
15 protocols are running across the interface as to
16 what it would do.
17     Q.  And what is -- strike that.
18         The MAC part of the words "mac-address,"
19 that refers to media access control, correct?
20     A.  Yes.
21     Q.  And we talked about that media access
22 control being a layer defined by OSI, correct?
23     A.  I think we were wondering whether it was
24 OSI or IEEE.
25     Q.  Thank you.

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1     Q.  Did you ever consider a command syntax
2 without the hyphen between "mac" and "address"?
3     A.  Stylistically, I prefer dashes as opposed
4 to cramming the words together.  I like commands
5 that have an English-like flavor to them.  And I
6 detest periods in commands and underscores.  So this
7 was . . .
8     Q.  Did you ever consider two -- let me strike
9 that.
10         Do you know what a token is in the context
11 of a command?
12     A.  Yes.
13     Q.  Did you ever consider a command syntax of
14 "mac address"?
15     A.  I don't recall if I did.
16     Q.  What impact would it have, if any, on the
17 user if -- strike that.
18         Would the CLI behave differently if the
19 command was "mac address," as opposed to
20 "mac-address"?
21         MR. NEUKOM:  Objection.  Hypothetical
22 question.
23         THE WITNESS:  Well, it behaves differently
24 in that instead of one token, there's two tokens.
25 So there would be that.

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34 (Pages 319 - 322)

1 but for different protocols, then it was a very easy
2 generalization.
3    Q. So a matter of minutes?
4    A. Once the decision had been made to do
5 that, yes.
6    Q. What do you think is creative about the
7 command "show ip route"?
8      MR. NEUKOM: Objection. Calls for opinion
9 and legal conclusion.
10      THE WITNESS: So for the "route" command,
11 I originally needed some way of saying -- what I
12 needed was a way of indicating to the software that
13 if I had a packet destined for a particular network,
14 which is the first argument, that I send it to a
15 particular IP address, which is the IP address of a
16 router. And one of those list of network and router
17 pairs may actually be the default, if I didn't find
18 a network mentioned anywhere and couldn't figure out
19 what to do with it. Otherwise, send it to this
20 particular router or gateway. Those are the pieces
21 of information that I needed, and I just -- I chose
22 the name "route." And "IP route" came along
23 afterwards.
24 BY MR. WONG:
25    Q. Are you the originator of the "show

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1 BY MR. WONG:
2    Q. The court reporter has marked Exhibit 467,
3 a document bearing control numbers
4 ARISTANDCA00032440 to 32812.
5      And my only question for you,
6 Mr. Lougheed, on this document marked as Exhibit 467
7 is, is this one of the ANSI/IEEE standards that
8 defines a spanning tree?
9      MR. NEUKOM: Objection. Vague. Also
10 calls for opinion testimony. And to the extent that
11 you can find a way to answer this question insofar
12 as the task is an assessment of a document which is
13 double-sided, still over an inch thick, and appears
14 to have --
15      THE WITNESS: 10-point font.
16      MR. NEUKOM: And appears to have about 350
17 pages. And that's right, size 6 font, size 8 font.
18 It's an unreasonable question on its face.
19 BY MR. WONG:
20    Q. Let me ask it this way, Mr. Lougheed.
21      At the top of page 467, top right, you see
22 it says "1998 edition," right?
23    A. Yes.
24    Q. Have you seen IEEE/ANSI standards before?
25    A. Yes.

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1 spanning-tree" command?
2    A. Yes, I am.
3    Q. What is a spanning tree?
4    A. My testimony earlier in the day addresses
5 that question.
6    Q. So thank you.
7      And your explanation of what is a spanning
8 tree earlier in today's deposition would be the same
9 for my question regarding the "show spanning-tree"
10 command; is that correct?
11    A. Right.
12    Q. And what functionality does the "show
13 spanning-tree" command perform?
14    A. It displayed global parameters having to
15 do with the spanning tree and interface-specific
16 parameters having to do with the spanning tree on
17 the box.
18    Q. And the term "spanning tree," you didn't
19 come up with that, right, Mr. Lougheed?
20    A. No, I didn't.
21    Q. The term "spanning tree" is used in
22 ANSI/IEEE standards, correct?
23    A. Yes. To my knowledge.
24      (Exhibit 467 marked for identification.)
25 ////

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1    Q. From the first page of Exhibit 467, do you
2 have any reason to doubt that this is an IEEE
3 standard?
4      MR. NEUKOM: Objection. Vague. Calls for
5 opinion testimony. And lack of foundation.
6      THE WITNESS: I'm willing to accept the
7 assertion that it's an IEEE standard.
8 BY MR. WONG:
9    Q. Had you ever reviewed the ANSI/IEEE
10 standard 802.1D 1998 edition?
11    A. I have never reviewed the 1998 edition of
12 IEEE 802.1D.
13    Q. Have you ever reviewed any other editions
14 of 802.1D?
15    A. A much earlier version.
16    Q. In that much earlier -- you can set that
17 down, Mr. Lougheed.
18      In that earlier version of 802.1D, do you
19 recall whether the standard used the term "spanning
20 tree"?
21      MR. NEUKOM: Objection. Vague. I'm
22 pretty sure if that document uses the word
23 "standard" the way the document before uses the word
24 "standard," the document presupposes a
25 mischaracterization of the document.

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37 (Pages 331 - 334)

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| | |
|---|---|
| 1 BY MR. WONG:<br>2    Q. Please answer.<br>3    A. What's your question again?<br>4    Q. Sure. In the earlier version of the<br>5 802.1D standard that you have reviewed -- strike<br>6 that.<br>7     You just testified that you had reviewed<br>8 an earlier version of the 802.1D standard earlier<br>9 than the 1998 edition, right?<br>10    A. Right.<br>11    Q. And do you recall approximately what year<br>12 that version of the 802.1D standard was?<br>13    A. Not the year. The year I would have<br>14 reviewed something like that would have been '87 or<br>15 '88.<br>16    Q. And in your review of that version of the<br>17 802.1D standard that you would have reviewed in 1987<br>18 or '88, do you recall whether the word "spanning<br>19 tree" existed in that document?<br>20    A. No, I don't recall if that word appeared<br>21 there.<br>22    Q. But when you came up with the "show<br>23 spanning-tree" command for Cisco IOS, had you heard<br>24 of the term "spanning tree" before that?<br>25    A. Yes, I had.<br><div align="right">Page 335</div> | 1     MR. NEUKOM: Objection. Calls for opinion<br>2 testimony.<br>3     THE WITNESS: I don't understand what you<br>4 mean by the word "creative."<br>5 BY MR. WONG:<br>6    Q. Do you believe that it took any degree of<br>7 creativity to come up with the command "show<br>8 spanning-tree"?<br>9     MR. NEUKOM: Same objection. Calls for<br>10 opinion testimony. Also calls for a legal<br>11 conclusion.<br>12     But notwithstanding my objections, you<br>13 should still try to answer these questions to the<br>14 best of your ability.<br>15     THE WITNESS: And the question is?<br>16 BY MR. WONG:<br>17    Q. Do you believe that it took any creativity<br>18 to come up with the command "show spanning-tree"?<br>19    A. I do believe that it shows a degree of<br>20 creativity.<br>21    Q. And describe -- go ahead.<br>22    A. I mean --<br>23    Q. Were you done with your answer?<br>24    A. Yes.<br>25    Q. And what is creative about the command<br><div align="right">Page 337</div> |
| 1    Q. And why did you choose to put a hyphen<br>2 between the words "spanning" and "tree"?<br>3    A. Because I like English phrases and I like<br>4 separating them with dashes.<br>5    Q. Why did you --<br>6    A. And I saw -- go ahead.<br>7    Q. No, no. I interrupted you, Mr. Lougheed.<br>8 Go ahead.<br>9    A. And I had no concept or no belief at the<br>10 time that I would need to turn that into a<br>11 hierarchy.<br>12    Q. And when you say -- refer to a need to<br>13 turn it into a hierarchy, are you referring to the<br>14 option of using a space instead of a hyphen in<br>15 between the word "spanning" and "tree"?<br>16    A. Yes.<br>17    Q. How long did it take for you to come up<br>18 with the command "show spanning-tree," the syntax?<br>19    A. The syntax? Once I had the protocol<br>20 working, wouldn't have been very long.<br>21    Q. Matter of minutes?<br>22    A. Less than a day.<br>23    Q. Do you think the command "show<br>24 spanning-tree" is creative?<br>25    A. I don't understand.<br><div align="right">Page 336</div> | 1 "show spanning-tree"?<br>2     MR. NEUKOM: Objection. Calls for a legal<br>3 conclusion and calls for opinion testimony.<br>4     THE WITNESS: And I just -- I'm not sure<br>5 what the hell you mean by "creative."<br>6 BY MR. WONG:<br>7    Q. Have you -- do you know what the word<br>8 "creative" means?<br>9     What do you understand the word "creative"<br>10 to mean? The question is, what do you understand<br>11 the word "creative" to mean?<br>12     MR. NEUKOM: Objection to form.<br>13     THE WITNESS: It's the ability to create<br>14 things. And I was creating a command expression to<br>15 monitor a piece of complex software.<br>16     What do you mean by "creative"?<br>17 BY MR. WONG:<br>18    Q. I'm going to use your definition of<br>19 creative here, Mr. Lougheed. Under your definition<br>20 of "creative," what's creative about the "show<br>21 spanning-tree" command?<br>22     MR. NEUKOM: Objection. Calls for opinion<br>23 testimony and calls for a legal conclusion.<br>24     THE WITNESS: Writing any piece of<br>25 software involves some degree of creativity. It may<br><div align="right">Page 338</div> |

<div align="right">38 (Pages 335 - 338)</div>

1    Q. And actually, if you look on that same
2 page, page 42 of Exhibit 464, the command right
3 above it is "timers basic (RIP)."
4       Do you see that?
5    A. Uh-huh.
6    Q. And you are also the originator of that
7 command, correct?
8    A. Yes.
9    Q. And the date of earliest known document
10 for that command is September 14th, 1989.
11       Do you see that?
12    A. Uh-huh.
13    Q. Is that -- strike that.
14       Did you work on different "timers"
15 commands at the -- roughly the same time period for
16 Cisco IOS?
17       MR. NEUKOM: Objection. Vague and
18 compound.
19 BY MR. WONG:
20    Q. Let me ask specifically, actually, about
21 these.
22       Did you work on the "timers basic" command
23 and the "timers bgp" command at the same time?
24    A. I don't know if it was the same time, but
25 it was certainly in the late '80s.

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1    Q. Were there already commands in Cisco IOS
2 at the time you added the "timers bgp" command where
3 the first token was the word "timers"?
4    A. Yes.
5    Q. What existing commands were present in
6 Cisco IOS that started with the first token of
7 "timers" when you added the "timers bgp" command?
8    A. They were all -- they were all subcommands
9 of the "routing" protocol command. They were --
10 that was the only -- the only domain that was -- the
11 "timers" command at that time was for routing --
12 adjusting timers for routing protocols.
13    Q. And just so I can understand, when you say
14 they were all subcommands of the "routing-protocol"
15 command, what is the "routing-protocol" command?
16    A. These days, it would be the "router"
17 command. And the "router" command -- it's a command
18 mode where you say "router," then the name on the
19 routing protocol, like "IGRP" or "RIP" or "BGP."
20 And then you would -- on subsequent lines, you would
21 give command expressions that would tweak stuff that
22 is specific to that particular protocol.
23    Q. So was the "timers bgp" command a
24 subcommand of the "routing-protocol" command?
25    A. Yes.

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1    Q. Do you have to --
2    A. It's either "routing-protocol" or
3 "router." The command form changed in that time
4 frame. But it's the same -- it's the same concept.
5    Q. So just so I understand, Mr. Lougheed,
6 before a user at the command-line interface types in
7 "timers bgp" as a command, before that, the user has
8 to type in a routing protocol command?
9    A. Right. For example, "router bgp,"
10 "timers" plus the number, and then you would say,
11 you know, "bgp timers" or timers bgp."
12    Q. Got it.
13       And BGP refers to border gateway protocol,
14 correct?
15    A. Yes.
16    Q. And we discussed border gateway protocol
17 during your first deposition. Remember that?
18    A. That correct.
19    Q. And as the 1989, BGP was already in IETF
20 industry standards, correct?
21    A. No.
22    Q. At what stage was -- strike that.
23       Today BGP is specified in IETF industry
24 standards, correct?
25    A. It is described in an RFC that is a

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1 standard -- what the IETF calls a standard, yes.
2    Q. So as of the time that the timers BGP
3 proto- -- strike that.
4       At the time that the timers BGP command
5 was added to Cisco IOS, at what stage was the BGP
6 standardization process in the IETF, to your
7 knowledge.
8    A. Yakov Rekhter and I came up with the very
9 first version of BGP in January of 1989, wrote an
10 RFC describing it. And there were other
11 implementations that were starting to pop up after
12 we did the first couple of RFCs. I don't
13 remember -- Yakov Rekhter was the person who handled
14 the standards process within the IETF.
15    Q. Do you remember the RFC number of the
16 first BGP RFC?
17    A. I believe it was 1105.
18    Q. I think you're right.
19       The source code relating to the Cisco fork
20 of the EE-CF software that was provided to counsel
21 in this case, you testified earlier that it had
22 different -- it had copies of source code other than
23 the Cisco fork. Do you remember that testimony?
24    A. Could you refresh me as to what the
25 question was you asked and what I answered?

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40 (Pages 343 - 346)

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1 Mr. Lougheed.
2      Now, those two sentences that you read
3 from the Stanford Ethertip User Guide marked as
4 Exhibit 36 and the Cisco Systems ASM/AGS User Manual
5 marked as Exhibit 476 are exactly the same, correct?
6    A. Yes. I wrote both sentences.
7    Q. And so Cisco copied those two sentences
8 from the Stanford guide marked as Exhibit 36 and put
9 them into the Cisco guide marked as Exhibit 476,
10 correct?
11      MR. NEUKOM: Objection. Asked and
12 answered a couple times now.
13      MR. WONG: I'm asking about those two
14 particular sentences.
15      MR. NEUKOM: Yeah. And before you asked a
16 blanket question and you didn't like his answer,
17 which I thought was a pretty darn good one. So you
18 decided to just keep him in the room --
19      MR. WONG: Counsel.
20      MR. NEUKOM: Look, you responded to my
21 objection. You wanted to engage me. So I'll
22 explain my objection. If you don't want me piping
23 up, that's fine. Just let me make objections for
24 the record.
25      Now you're asking him the exact same

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1 question after having had the fourth employee of
2 Cisco, Mr. Lougheed, who is now here at almost 5:00
3 reading aloud from documents. And you asked him the
4 same question again to see if you can get a
5 different answer. So go for it. This is starting
6 to feel increasingly not very respectful of this
7 witness's time.
8 BY MR. WONG:
9    Q. Do you want me to read the question again?
10 I'll read the question again.
11    A. That would be fine.
12    Q. Cisco copied those two sentences that you
13 just read aloud into the record for its user manual
14 marked as Exhibit 476 from the Stanford user manual
15 marked as Exhibit 36, correct?
16    A. I wrote both manuals.
17      MR. WONG: I have no further questions.
18      THE VIDEOGRAPHER: This concludes today's
19 videotaped deposition of Mr. Kirk --
20      MR. NEUKOM: Oh, I'm sorry to interrupt.
21      On behalf of Mr. Lougheed, he reserves the
22 right to review an errata of the transcript. I
23 don't know, Ryan, if we've been doing this by
24 stipulation for all witnesses, even if it's not put
25 on the record.

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1      MR. WONG: I think it's our understanding
2 that all witnesses can have 30 days or something.
3      MR. NEUKOM: By stipulation.
4      MR. WONG: Great.
5      THE VIDEOGRAPHER: This concludes today's
6 videotaped deposition of Mr. Kirk Lougheed. We're
7 off the record at 4:37 p m.
8      (TIME NOTED: 4:37 P.M.)
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1      DECLARATION UNDER PENALTY OF PERJURY
2
3    I, KIRK LOUGHEED, the witness herein,
4 declare under penalty of perjury that I have read the
5 foregoing in its entirety; and that the testimony
6 contained therein, as corrected by me, is a true and
7 accurate transcription of my testimony elicited at said
8 time and place.
9
10    Executed this _____ day of _____ 2016, at
11 _____, _____.
12    (City)          (State)
13
14
15
16
17    _____
18         KIRK LOUGHEED
19
20
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24
25

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1      REPORTER'S CERTIFICATION

2      I, Leslie Johnson, a Certified Shorthand

3 Reporter of the State of California, do hereby certify:

4      That the foregoing proceedings were taken

5 before me at the time and place herein set forth; that

6 any witnesses in the foregoing proceedings, prior to

7 testifying, were administered an oath; that a record of

8 the proceedings was made by me using machine shorthand

9 which was thereafter transcribed under my direction;

10 that the foregoing transcript is a true record of the

11 testimony given.

12      Further, that if the foregoing pertains to

13 the original transcript of a deposition in a Federal

14 Case, before completion of the proceedings, review

15 of the transcript [ ] was [ ] was not requested.

16 I further certify I am neither financially interested in

17 the action nor a relative or employee of any attorney or

18 any party to this action.

19      IN WITNESS WHEREOF, I have this date

20 subscribed my name.

21 Dated: April 19, 2016

22

23      *Leslie Johnson*

24      LESLIE JOHNSON

25      CSR No. 11451, RPR, CCRR

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1        UNITED STATES DISTRICT COURT

2     FOR THE NORTHERN DISTRICT OF CALIFORNIA

3

4     _____

5   CISCO SYSTEMS, INC.,            )

6            Plaintiff,             )

7        vs.                        ) Civil Action No.:

8   ARISTA NETWORKS, INC.,          ) 5:14-cv-05344-BLF(PSG)

9            Defendant.             )

10  _____ )

11

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13

14   VIDEOTAPED DEPOSITION OF DEVADAS PATIL

15            Palo Alto, California

16         Sunday, February 21, 2016

17                 Volume 1

18

19

20

21  Reported by:

22  RACHEL FERRIER, CSR No. 6948

23  Job No. 2223126

24

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| 1     UNITED STATES DISTRICT COURT<br>2    FOR THE NORTHERN DISTRICT OF CALIFORNIA<br>3<br>4 _____<br>5 CISCO SYSTEMS, INC ,    )<br>6     Plaintiff,    )<br>7   vs        )Civil Action No :<br>8 ARISTA NETWORKS, INC ,   )5:14-cv-05344-BLF(PSG)<br>9     Defendant    )<br>10 _____)<br>11<br>12<br>13<br>14    VIDEOTAPED DEPOSITION OF DEVADAS PATIL, VOLUME 1.<br>15 taken on behalf of the Defendant, at Wilson Sonsini<br>16 Goodrich & Rosati, 650 Page Mill Road, Palo Alto,<br>17 California, beginning at 9:25 a m  and ending at<br>18 3:44 p m  on Sunday, February 21, 2016, before<br>19 RACHEL FERRIER, Certified Shorthand Reporter No  6948<br>20<br>21<br>22<br>23<br>24<br>25<br>                           Page 2 | 1             INDEX<br>2<br>3 WITNESS            EXAMINATION<br>4 DEVADAS PATIL<br>5 VOLUME 1<br>6   BY MR. RYAN          8, 121<br>7   BY MR. CANNON       217<br>8<br>9<br>10<br>11      INSTRUCTION NOT TO ANSWER<br>12       Page   Line<br>13        13    2<br>14<br>15<br>16<br>17<br>18<br>19<br>20<br>21<br>22<br>23<br>24<br>25<br>                           Page 4 |
| 1 APPEARANCES:<br>2<br>3 For Plaintiff:<br>4    KEKER & VAN NEST LLP<br>5    BY: RYAN WONG<br>6    Attorney at Law<br>7    633 Battery Street<br>8    San Francisco, CA 94111<br>9    415.773.6682<br>10   rwong@kvn.com<br>11<br>12 For Defendant:<br>13   QUINN EMANUEL URQUHART & SULLIVAN, LLP<br>14   BY: MATTHEW D. CANNON<br>15   Attorney at Law<br>16   50 California Street, 22nd Floor<br>17   San Francisco, CA 94111<br>18   415.875.6412<br>19   matthewcannon@quinnemanuel.com<br>20<br>21<br>22 Videographer:<br>23   SOSEH KEVORKIAN<br>24<br>25<br>                           Page 3 | 1         EXHIBITS<br>2 NUMBER      DESCRIPTION      PAGE<br>3<br>4 Exhibit 310  Subpoena to Testify at a<br>          Deposition in a Civil<br>5       Action to Devadas Patil    21<br>6 Exhibit 311  Letter dated 2/19/16 to<br>7       Devadas Patil from Sean Park   22<br>8 Exhibit 312  Resume for Devadas Patil    29<br>9 Exhibit 313  Resume for Devadas Patil<br>          (Bates CSI-CLI-01611242 -<br>10      01611243)          49<br>11 Exhibit 314  "Business Development Trends and<br>12       Analysis for the Data Networking<br>13       Market" by Devadas Patil    107<br>  Exhibit 315  IEEE 802.1AB Standard for<br>14       local and metropolitan<br>15       area networks<br>16       (Bates ARISTANDCA00017907<br>          - 18078)       117<br>17 Exhibit 316  Spreadsheet entitled<br>18       "Corrected Information<br>19       Regarding Cisco Command<br>20       Expression Associated<br>          with Devadas Patil"    121<br>21 Exhibit 317  LLDP on Cisco IOS Software<br>22       Functional Specification<br>23       (Bates CSI-CLI-01507526<br>24       - 01507544)     134<br>25<br>                           Page 5 |

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4 Exhibit 318   Parser-Police Manifest,
5       Version 5
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6 Exhibit 319   E-mail dated 10/10/07
7       from Devadas Patil
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9 Exhibit 320   E-mail chain dated 8/10/06
10      from Devadas Patil
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21 Exhibit 324   E-mail chain dated 2/1/06
22      from Devadas Patil
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24     - 811128)       212
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1     MR CANNON: Matthew Cannon from Quinn, Emanuel   09:26AM
2 on behalf of Plaintiff Cisco and the witness      09:26AM
3     THE VIDEOGRAPHER: Thank you      09:26AM
4       DEVADAS PATIL,      09:26AM
5 having been administered an oath, was examined and    09:26AM
6 testified as follows:      09:26AM
7       EXAMINATION      09:26AM
8 BY MR WONG:       09:26AM
9   Q   Good morning      09:26AM
10   A   Morning      09:26AM
11   Q   Please state your full name for the record    09:26AM
12   A   Devadas Patil      09:26AM
13   Q   And, Mr Patil, what is your home address?    09:26AM
14   A   3137 Kittery Avenue in San Ramon, California    09:26AM
15 94583       09:26AM
16   Q   And who is your current employer, Mr Patil?    09:26AM
17   A   GE Digital      09:27AM
18   Q   Do you have a work e-mail address for GE Digital? 09:27AM
19   A   I do      09:27AM
20   Q   Could you please state it for the record    09:27AM
21   A   It is devadas patil@ge com      09:27AM
22   Q   Do you have any personal e-mail addresses that    09:27AM
23 you use, Mr Patil?      09:27AM
24   A   I do      09:27AM
25   Q   Could you please state those for the record    09:27AM

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1   Palo Alto, California; Sunday, February 21, 2016
2       9:25 a m
3
4     THE VIDEOGRAPHER: Good morning      09:25AM
5     THE WITNESS: Morning      09:25AM
6     THE VIDEOGRAPHER: We are on the record at    09:25AM
7 9:25 a m on February 21st, 2016      09:25AM
8     This is the video-recorded deposition of Devadas 09:25AM
9 Patil      09:25AM
10     My name is Soseh Kevorkian, here with our Court   09:25AM
11 Reporter, Rachel Ferrier   We are here on behalf of    09:25AM
12 Defendants at 650 Page Mill Road in Palo Alto     09:25AM
13     The caption of this case is Cisco Systems,    09:25AM
14 Incorporated, versus Arista Networks, Incorporated, Case 09:25AM
15 No 5:14-cv-05344- BLF(PSG)      09:25AM
16     Please note that audio and video recording will   09:25AM
17 take place unless all parties agree to go off the    09:26AM
18 record      09:26AM
19     Microphones are sensitive   They pick up    09:26AM
20 whispers, private conversations, and all cellular    09:26AM
21 interference      09:26AM
22     At this time, would counsel and all present    09:26AM
23 please identify themselves for the record     09:26AM
24     MR WONG: Ryan Wong from Keker & Van Nest for   09:26AM
25 Defendant Arista Networks      09:26AM

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1   A   Dpatil44@hotmail.com.      09:27AM
2   Q   Anything else?      09:27AM
3   A   That's the only one I do use.      09:27AM
4   Q   Okay. And you current -- or, excuse me, strike   09:27AM
5 that.      09:27AM
6     You previously worked for Cisco; correct?    09:27AM
7   A   That's correct.      09:27AM
8   Q   Did you have an e-mail address when you were    09:27AM
9 employed at Cisco?      09:27AM
10   A   Yes.      09:27AM
11   Q   And what was that e-mail address while you were   09:27AM
12 employed at Cisco?      09:27AM
13   A   If I recall from five years ago, it's     09:27AM
14 dpatil@cisco.com, I think.      09:27AM
15   Q   Okay. Mr. Patil, are you being represented by   09:28AM
16 counsel at this deposition?      09:28AM
17   A   Yes.      09:28AM
18   Q   Okay. And who's representing you at this    09:28AM
19 deposition?      09:28AM
20   A   Matt Cannon.      09:28AM
21   Q   Mr. Cannon --      09:28AM
22   A   Mr. Cannon --      09:28AM
23   Q   -- to your left?      09:28AM
24   A   Correct.      09:28AM
25   Q   Have you ever been deposed before, Mr. Patil?   09:28AM

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|---|---|
| 1 BY MR. WONG: 11:09AM | 1 exchange information with and exchange ideas with, and 11:12AM |
| 2 Q Can you describe for me, just so I can 11:09AM | 2 so as part of that, I worked with pro- -- product 11:12AM |
| 3 understand, at what -- what are the various stages, in 11:09AM | 3 managers, and I did my own research to see who else is 11:12AM |
| 4 your mind, are a part of the development of the LLDP 11:09AM | 4 active -- actively working on this technology and what 11:12AM |
| 5 features at Cisco? 11:09AM | 5 platforms they are targeting, what markets they are 11:12AM |
| 6 A Back then, we were following what is probably 11:09AM | 6 going after, etc . and what -- ultimately, what our 11:13AM |
| 7 known as waterfall model, and it was a classic waterfall 11:10AM | 7 requirements for Phase 1 are 11:13AM |
| 8 experience, in a sense, that there was market analysis, 11:10AM | 8 Q You mentioned, as some of the vendors that you 11:13AM |
| 9 slash, requirements gathering. Then there was 11:10AM | 9 looked at, the HP ProCurve; is that right? 11:13AM |
| 10 architecture, and then there was design, and then there 11:10AM | 10 A That's right 11:13AM |
| 11 was implementation, and then there was testing, in each 11:10AM | 11 Q You also mentioned Nortel? 11:13AM |
| 12 of the phases that I mentioned earlier. 11:10AM | 12 A Yes 11:13AM |
| 13 Q So the first phase of the three phases you 11:10AM | 13 Q What equipment of Nortel's did you look at as 11:13AM |
| 14 mentioned earlier was the discovery aspect, as you 11:10AM | 14 part of this market analysis stage for Phase 1? 11:13AM |
| 15 called it, of implementing LLDP; correct? 11:10AM | 15 A I looked at their ability to -- I was sort of 11:13AM |
| 16 A Yes. 11:10AM | 16 thinking ahead in that I looked at their platforms that 11:13AM |
| 17 Q So the first stage of implementing Phase 1 -- 11:10AM | 17 support the endpoints, such as desk -- desk phones, and 11:14AM |
| 18 strike that. 11:10AM | 18 see how -- see what Nortel does to discover desk phones 11:14AM |
| 19 So when I say "Phase 1 of the LLDP project," do 11:10AM | 19 and service them 11:14AM |
| 20 you understand that I'm referring to the discovery 11:11AM | 20 I looked at -- so that -- and later on, of 11:14AM |
| 21 aspect of that project? 11:11AM | 21 course, in Phase 3, I was looking at exactly what Nortel 11:14AM |
| 22 A I do. 11:11AM | 22 is doing to support locations 11:14AM |
| 23 Q Now, for Phase 1 of the LLDP project, did the 11:11AM | 23 Q So let's just stick with what you did for 11:14AM |
| 24 list of stages you just described apply to that phase? 11:11AM | 24 Phase 1 11:14AM |
| 25 A Yes. 11:11AM | 25 A Yes Yes 11:14AM |
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| | |
|---|---|
| 1 Q So the market analysis and requirements phase 11:11AM | 1 Q Did you do anything else with respect to Nortel 11:14AM |
| 2 is -- strike that 11:11AM | 2 equipment with respect to the market analysis portion of 11:14AM |
| 3 So the market analysis and requirement stage is 11:11AM | 3 Phase 1? 11:14AM |
| 4 the first stage in the multistage process for Phase 1 of 11:11AM | 4 A I read -- I might have read some white papers to 11:14AM |
| 5 the LLDP project? 11:11AM | 5 see, you know, how -- how endpoint-to-infrastructure 11:14AM |
| 6 A That's correct 11:11AM | 6 discovery happens in a -- in a typical Nortel 11:14AM |
| 7 Q Is there anything that precedes the market 11:11AM | 7 deployment, but that's about all for Phase 1 11:14AM |
| 8 analysis portion -- strike that 11:11AM | 8 Q And why were you looking at that aspect of 11:14AM |
| 9 Is there anything that precedes the market 11:11AM | 9 Nortel's business in connection with Phase 1 of the LLDP 11:15AM |
| 10 analysis stage as part of this multistage process you 11:11AM | 10 project 11:15AM |
| 11 described? 11:11AM | 11 A Primarily to understand the market landscape, to 11:15AM |
| 12 A No 11:11AM | 12 see who -- who is -- who is doing this and how they are 11:15AM |
| 13 Q So the first thing you did when you were working 11:11AM | 13 doing it now and what -- what they have planned for this 11:15AM |
| 14 on Phase 1 of the LLDP project was to perform a market 11:11AM | 14 new technology coming in in the form of LLDP and how we 11:15AM |
| 15 analysis to see what other vendors were doing; is that 11:11AM | 15 are going at it, just an understanding of that 11:15AM |
| 16 correct? 11:11AM | 16 Q And you did a similar analysis for the HP 11:15AM |
| 17 MR CANNON: Objection; vague, mischaracterizes 11:11AM | 17 ProCurve; is that correct? 11:15AM |
| 18 the witness's prior testimony 11:12AM | 18 A No 11:15AM |
| 19 THE WITNESS: No No It -- it -- that's not 11:12AM | 19 Q What did you do for the HP ProCurve -- actually, 11:15AM |
| 20 accurate 11:12AM | 20 strike Let me re-ask -- let me rephrase the question 11:15AM |
| 21 BY MR WONG: 11:12AM | 21 What did you look at as part of the market 11:15AM |
| 22 Q What is inaccurate about what I just asked you? 11:12AM | 22 analysis stage of Phase 1 when you were looking at the 11:15AM |
| 23 A I didn't do it as a requirement I did it as 11:12AM | 23 HP ProCurve? 11:15AM |
| 24 aside effect in the sense that this whole protocol was 11:12AM | 24 A My interaction with the HP ProCurve was, of 11:16AM |
| 25 very -- was brand new and I needed someone to -- to 11:12AM | 25 course, to -- to read about their product, what feature 11:16AM |
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| 1 sets they have on that particular product, and I recall   11:16AM | 1    Q   And this is specific to Phase 1 of the LLDP        11:19AM |
| 2 that my interaction with HP ProCurve was more technical   11:16AM | 2 project?                                    11:19AM |
| 3 in the sense that I actively exchanged LLDP concept --   11:16AM | 3      MR. CANNON: Same objection.                  11:19AM |
| 4 concepts with people representing HP ProCurve in -- in   11:16AM | 4      THE WITNESS: Yes. I recall discussing how        11:19AM |
| 5 the standards in -- in the -- in the IETF standards      11:16AM | 5 sub-interfaces are handled. I recall that for sure. I   11:19AM |
| 6    Q   What LLDP concepts did you discuss with your       11:16AM | 6 also recall several other discussions about some of the   11:19AM |
| 7 contact at HP during the market analysis stage of        11:16AM | 7 fields in the TLV data that we send in LLDP.            11:20AM |
| 8 Phase 1?                                    11:16AM | 8 BY MR. WONG:                                11:20AM |
| 9    A   During the market analysis, not -- not -- nothing   11:16AM | 9    Q   What is TLV?                            11:20AM |
| 10 significant with HP ProCurve, I would say        11:16AM | 10    A   It's an acronym for type, length, and value.      11:20AM |
| 11    Q   How about just during any stages of Phase 1; what   11:17AM | 11    Q   Did you come up with that acronym?             11:20AM |
| 12 type of LLDP concepts did you discuss with your         11:17AM | 12    A   No.                                   11:20AM |
| 13 colleagues at HP ProCurve?                  11:17AM | 13    Q   Do you know who came up with that acronym?        11:20AM |
| 14    A   I recall having discussed some of the topics in   11:17AM | 14    A   It is widely used in the standard.            11:20AM |
| 15 the standard that were not immediately clear, and I      11:17AM | 15    Q   When you say "widely used in the standard," are   11:20AM |
| 16 discussed the language in there to be certain that it   11:17AM | 16 you referring to the LLDP standard?                 11:20AM |
| 17 means a -- means a certain entity in our implementation   11:17AM | 17    A   That's correct.                         11:20AM |
| 18 and how it maps to in their implementation, etc        11:17AM | 18    Q   Did you also speak with -- strike that.       11:20AM |
| 19    Q   Were these conver- -- strike that            11:17AM | 19      What type of market analysis did you do with      11:20AM |
| 20      Were these communications by phone?            11:17AM | 20 respect to Ericsson in Phase 1 of the LLDP project?      11:20AM |
| 21    A   Mainly through e-mail                  11:17AM | 21    A   Not much. I must have -- I was -- I was under    11:20AM |
| 22    Q   And were you using your Cisco e-mail account for   11:17AM | 22 time pressure to finish Phase 1 on -- in -- in a timely   11:21AM |
| 23 those communications?                      11:17AM | 23 manner, and, basically, I was looking at other people    11:21AM |
| 24    A   Yes                                11:17AM | 24 actively involved in -- in actual development of this    11:21AM |
| 25    Q   You don't have any copies of those e-mail        11:18AM | 25 product. And as a side effect of that, I was reading     11:21AM |
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| 1 communications that you might have had with HP ProCurve,   11:18AM | 1 white papers as fast as I could to see what other        11:21AM |
| 2 do you?                                    11:18AM | 2 network vendors are involved in this area; discovery      11:21AM |
| 3    A   No  No                              11:18AM | 3 area, servicing, endpoint, etc , in general, and I must   11:21AM |
| 4    Q   You mentioned that you were discussing with HP    11:18AM | 4 have done some research on Ericsson as well            11:21AM |
| 5 ProCurve topics relating to IETF standards?          11:18AM | 5    Q   Okay  So you didn't speak to anybody at Ericsson   11:21AM |
| 6    A   The LLDP standard                  11:18AM | 6 who was working on LLDP?                        11:21AM |
| 7    Q   Is the IETF the standard-setting body for LLDP?   11:18AM | 7    A   No                                   11:21AM |
| 8    A   I've not been in touch with LLDP for a few years   11:18AM | 8    Q   What about Juniper; what was your -- strike that   11:21AM |
| 9 now, but my recollection is LLDP originated -- I don't   11:18AM | 9      What type of market analysis did you do for       11:21AM |
| 10 know whether it's LLDP or LLDP-MED -- outside of IETF   11:18AM | 10 Phase 1 of the LLDP project with respect to Juniper?     11:21AM |
| 11 first, and then two organizations have to -- have to    11:18AM | 11    A   None                                11:21AM |
| 12 come together to actually ratify the standard, but I    11:18AM | 12    Q   Okay  Aside from HP ProCurve, Nortel, and       11:21AM |
| 13 know that IETF had a big -- IEEE -- IEEE and IETF had a   11:18AM | 13 Ericsson, were there any other third-party vendors that   11:22AM |
| 14 big role in it                            11:19AM | 14 you investigated as part of the market analysis stage of   11:22AM |
| 15    Q   Did you discuss any implementation-related issues   11:19AM | 15 Phase 1 of the LLDP project?                     11:22AM |
| 16 with the colleagues at HP ProCurve with respect to      11:19AM | 16    A   Yes                                 11:22AM |
| 17 Phase 1 of the LLDP project?                  11:19AM | 17    Q   What are those other vendors?                11:22AM |
| 18      MR CANNON: Objection; vague, asked and         11:19AM | 18    A   Mitel, Avaya, Polycom                    11:22AM |
| 19 answered                                 11:19AM | 19    Q   Any other vendors?                      11:22AM |
| 20      THE WITNESS: Yes                      11:19AM | 20    A   Yes, but I can't recall their names at this time   11:22AM |
| 21 BY MR  WONG:                              11:19AM | 21    Q   You mentioned that you actively communicated with   11:22AM |
| 22    Q   What aspects of the actual implementation of LLDP   11:19AM | 22 somebody from HP ProCurve; correct?                 11:22AM |
| 23 did you discuss with the HP ProCurve engineers?        11:19AM | 23    A   Yes                                 11:22AM |
| 24      MR CANNON: Objection; vague              11:19AM | 24    Q   Were there any other people that you actively     11:22AM |
| 25 BY MR  WONG:                              11:19AM | 25 communicated with while working on Phase 1 of the LLDP   11:22AM |
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|---|---|
| 1 project at Cisco?                                    11:22AM | 1 progression of development, and being able to abstract   11:26AM |
| 2      MR. CANNON: Objection; vague.              11:22AM | 2 the current implementation to allow for that is what I   11:26AM |
| 3      THE WITNESS: Yes.                            11:22AM | 3 mean by "extensibility "                          11:26AM |
| 4 BY MR. WONG:                                     11:22AM | 4    Q  So when you were discussing the LLDP project --   11:26AM |
| 5    Q  Who else were you working with when you were   11:22AM | 5 Phase 1 one of the LLDP project with your colleagues at   11:26AM |
| 6 working on Phase 1 of the LLDP project at Cisco?     11:23AM | 6 HP, did you talk about what you were planning to do for   11:26AM |
| 7    A  You mean external to Cisco?                  11:23AM | 7 Cisco's implementation?                          11:26AM |
| 8    Q  External to Cisco, yes.                      11:23AM | 8      MR CANNON: Objection; vague              11:26AM |
| 9    A  I must have sent some e-mails clarifying some of   11:23AM | 9      THE WITNESS: No                           11:26AM |
| 10 the language in the standard, and I don't recall the    11:23AM | 10 BY MR WONG:                                  11:26AM |
| 11 actual people that responded to me from the standards   11:23AM | 11    Q  Okay  Did your colleague tell you what HP was   11:26AM |
| 12 e-mail areas, but I would say a few e-mails with people   11:23AM | 12 planning to do for HP's implementation?           11:26AM |
| 13 other than HP ProCurve that were part of the standards   11:23AM | 13      MR CANNON: Objection; vague              11:26AM |
| 14 body, and, of course, HP ProCurve people were also in   11:23AM | 14      THE WITNESS: No                           11:26AM |
| 15 the standards body.                               11:23AM | 15 BY MR WONG:                                  11:27AM |
| 16    Q  And when you are referring to "the standards,"   11:23AM | 16    Q  Which of those vendors that we just discussed    11:27AM |
| 17 are you referring to the IEEE?                     11:23AM | 17 were also in the process of implementing LLDP in their   11:27AM |
| 18    A  Yes.                                        11:23AM | 18 products?                                       11:27AM |
| 19    Q  Are you an IEEE member, Mr. Patil?          11:23AM | 19    A  I know for sure that HP ProCurve was  I -- I    11:27AM |
| 20    A  I am, but I'm not very active.               11:23AM | 20 think Nortel was too, but I was not 100 percent sure    11:27AM |
| 21    Q  How long have you been a member of the IEEE?   11:23AM | 21      MR WONG: Why don't we take a quick break       11:27AM |
| 22    A  I don't know whether my membership has actually   11:24AM | 22      THE WITNESS: Okay                         11:27AM |
| 23 expired, but I started very early in the '90s.       11:24AM | 23      THE VIDEOGRAPHER: We are going off the record at 11:27AM |
| 24    Q  And were you involved in the standard-setting   11:24AM | 24 11:27 a m                                      11:27AM |
| 25 process for LLDP?                                11:24AM | 25     (Recess taken )                            11:27AM |
| Page 78 | Page 80 |
| 1    A  No                                          11:24AM | 1      THE VIDEOGRAPHER: We are back on the record at   11:33AM |
| 2    Q  Why was it important for you to find other people  11:24AM | 2 11:33 a m                                       11:33AM |
| 3 to talk to while you were working on Phase 1 of the LLDP  11:24AM | 3 BY MR WONG:                                  11:33AM |
| 4 project?                                          11:24AM | 4    Q  Before the break, Mr Patil, we were discussing    11:33AM |
| 5    A  To make the right architectural and design      11:24AM | 5 the various stages that are involved in implementing the   11:33AM |
| 6 decisions so that we don't have to tear down a lot of    11:24AM | 6 LLDP project at Cisco                            11:34AM |
| 7 stuff later, post-implementation, post-testing, and     11:24AM | 7    A  Mm-hmm                                   11:34AM |
| 8 that's the, I would say, cautious approach for a project  11:24AM | 8    Q  We were talking specifically about Phase 1       11:34AM |
| 9 of this size                                       11:24AM | 9    A  Yes                                        11:34AM |
| 10    Q  How does talking with other vendors outside of    11:24AM | 10    Q  During what phase -- strike that               11:34AM |
| 11 Cisco help you to make the right architectural and      11:24AM | 11      During what stage of the stages that you        11:34AM |
| 12 design decisions with respect to Cisco's LLDP         11:25AM | 12 described are the syntaxes for the commands created?    11:34AM |
| 13 implementation?                                  11:25AM | 13      MR CANNON: Objection; vague              11:34AM |
| 14    A  It gives us an understanding of how this can be   11:25AM | 14      THE WITNESS: Both Phase 1 and Phase 2         11:34AM |
| 15 done in phases  It helps us avoid costly architectural   11:25AM | 15 BY MR WONG:                                  11:34AM |
| 16 and design mistakes so that we abstract the initial      11:25AM | 16    Q  I'm sorry, my question was: During which of the   11:34AM |
| 17 implementation for extensibility, and it also helps us   11:25AM | 17 stages that you listed out for me are the syntaxes for    11:34AM |
| 18 plan for things coming down the pipeline, such as       11:25AM | 18 the commands, and specifically the LLDP commands,      11:34AM |
| 19 Phase 2 or even Phase 3 when it comes to a map and     11:25AM | 19 created?                                        11:34AM |
| 20 locations                                        11:25AM | 20      MR CANNON: Objection; vague              11:34AM |
| 21    Q  What do you mean by "extensibility"?         11:25AM | 21      THE WITNESS: In the design specification for the   11:34AM |
| 22    A  The ability to support value-added features to    11:25AM | 22 phase                                          11:34AM |
| 23 target certain markets  An example is something like    11:26AM | 23 BY MR WONG:                                  11:34AM |
| 24 inline power provisioning on endpoints through LLDP    11:26AM | 24    Q  And just so it's clear to me, the first stage     11:34AM |
| 25 Knowing that it's coming in the roadmap, in the        11:26AM | 25 that you described was the market analysis and         11:35AM |
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| | |
|---|---|
| 1 requirement stage; correct? 11:35AM | 1 Routing Information Base that I talked about earlier -- 11:37AM |
| 2 A Correct. 11:35AM | 2 or mentioned 11:37AM |
| 3 Q And the second stage that you described was an 11:35AM | 3 Q How -- focusing specifically on Phase 1 of the 11:37AM |
| 4 architectural stage; is that right? 11:35AM | 4 LLDP project, how was that a key architectural decision? 11:37AM |
| 5 A That's correct. 11:35AM | 5 MR CANNON: Objection; vague 11:37AM |
| 6 Q And the third stage is the design stage? 11:35AM | 6 BY MR WONG: 11:37AM |
| 7 A Yes. 11:35AM | 7 Q I'm using your own words here in your resume, 11:37AM |
| 8 Q So it's the third stage where the command syntax 11:35AM | 8 Mr Patil 11:38AM |
| 9 for the LLDP commands, talking specifically with respect 11:35AM | 9 How was that -- how was Phase 1 of the LLDP 11:38AM |
| 10 to Phase 1, were created; correct? 11:35AM | 10 project a key architectural decision for Cisco products? 11:38AM |
| 11 A That's correct. 11:35AM | 11 MR CANNON: Objection; vague, mischaracterizes 11:38AM |
| 12 MR. CANNON: Objection; vague. 11:35AM | 12 testimony 11:38AM |
| 13 BY MR. WONG: 11:35AM | 13 THE WITNESS: From an architectural perspective, 11:38AM |
| 14 Q Was there any discussion with any of the third 11:35AM | 14 it was -- it had to do with how to co-exist with 11:38AM |
| 15 parties that we just discussed about the commands that 11:35AM | 15 existing protocols and features on Cisco platforms 11:38AM |
| 16 would be used for LLDP? 11:35AM | 16 BY MR WONG: 11:38AM |
| 17 MR. CANNON: Objection; vague. 11:35AM | 17 Q And what did you do with respect to Phase 1 of 11:38AM |
| 18 THE WITNESS: No. 11:35AM | 18 the LLDP project to ensure that it co-existed with 11:38AM |
| 19 BY MR. WONG: 11:35AM | 19 existing protocols and features on Cisco platforms? 11:38AM |
| 20 Q Was there any discussion with any of the third 11:35AM | 20 A From an architectural standpoint, kept the LLDP 11:38AM |
| 21 parties that we just discussed about the interface -- 11:35AM | 21 database insulated and separate and disjoined from other 11:38AM |
| 22 command-line interface in general that would be used for 11:35AM | 22 discovery protocols 11:39AM |
| 23 LLDP? 11:36AM | 23 And from a protocol standpoint, made sure that 11:39AM |
| 24 A No. 11:36AM | 24 there is no relationship or collaboration between 11:39AM |
| 25 Q Looking back at Exhibit 313 under the description 11:36AM | 25 discovery protocols and they just function 11:39AM |
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| | |
|---|---|
| 1 under "Cisco Systems." 11:36AM | 1 independently 11:39AM |
| 2 A Yeah. 11:36AM | 2 Q Before the break, you testified about 11:39AM |
| 3 Q It says, "... lead design and development of 11:36AM | 3 conversations that you had with someone at HP ProCurve 11:39AM |
| 4 software modules of Cisco IOS." 11:36AM | 4 regarding LLDP 11:39AM |
| 5 Do you see that? 11:36AM | 5 A Yes 11:39AM |
| 6 A Yes. 11:36AM | 6 Q Do you remember that? 11:39AM |
| 7 Q What software modules of Cisco IOS are you 11:36AM | 7 A Yes 11:39AM |
| 8 referring to there? 11:36AM | 8 Q Who was the person or persons that you spoke with 11:39AM |
| 9 A In terms of actual leadership for those modules, 11:36AM | 9 at HP ProCurve regarding Phase 1 of the LLDP project? 11:40AM |
| 10 I led the Phase 1 for LLDP, Phase 2 of LLDP. I also led 11:36AM | 10 A I do not recall their name, but I do remember 11:40AM |
| 11 another project which was completely unrelated. 11:36AM | 11 that he was a highly knowledgeable person at HP ProCurve 11:40AM |
| 12 Q And what was that project about? 11:36AM | 12 who was responsible for product development, as well as 11:40AM |
| 13 A It was a product for developing what is called 11:36AM | 13 represent HP ProCurve at IEEE 11:40AM |
| 14 Multilayer Routing Information Base. 11:37AM | 14 Q And how did you come to know of this person at HP 11:40AM |
| 15 Q Further down in Exhibit 313, in that same 11:37AM | 15 ProCurve? 11:40AM |
| 16 paragraph, it says, "Made key architectural decisions 11:37AM | 16 A I don't recall the actual event that made me 11:40AM |
| 17 for products, resulting in successful deliveries for 11:37AM | 17 aware of this person, but it might have been through 11:40AM |
| 18 several multi-billion dollar market segments." 11:37AM | 18 some keyword search that eventually led to their contact 11:40AM |
| 19 Do you see that? 11:37AM | 19 information 11:40AM |
| 20 A Mm-hmm. 11:37AM | 20 Q When you say "keyword search," what type of 11:40AM |
| 21 Q What are you talking about there? 11:37AM | 21 search are you referring to? 11:41AM |
| 22 A I'm talking primarily about Phase 1 of LLDP and 11:37AM | 22 A A search on LLDP feature set of our -- the 11:41AM |
| 23 Phase 2 of LLDP and even, to some extent, MLRIB. 11:37AM | 23 mechanics of it at a -- at a level deeper than what one 11:41AM |
| 24 Q What was that last acronym you said? 11:37AM | 24 would search for discovery protocols in general So 11:41AM |
| 25 A "MLRIB," which stood for the Multilayer Layer 11:37AM | 25 something that's technical and involved from an 11:41AM |
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|---|---|
| 1  MR WONG: Right 12:24PM | 1  activity for LLDP was -- was happening, and it -- I 12:28PM |
| 2  Q The Arista Networks's EOS was an example of 12:24PM | 2  recall that it was -- it was slow for a period of time 12:28PM |
| 3  innovation in this area; correct? 12:24PM | 3  in between and then it took off again. 12:28PM |
| 4  MR CANNON: Objection; vague -- 12:24PM | 4  BY MR. WONG: 12:28PM |
| 5  THE WITNESS: Example, yes 12:24PM | 5  Q And you didn't participate in any of the efforts 12:28PM |
| 6  MR CANNON: -- mischaracterizes prior testimony, 12:24PM | 6  to standardize LLDP from the '90s to 2004; is that 12:28PM |
| 7  lacks foundation, calls for improper opinion testimony 12:24PM | 7  right? 12:28PM |
| 8  BY MR WONG: 12:24PM | 8  A No. No. 12:28PM |
| 9  Q And these are -- these are your words here on 12:24PM | 9  Q And you played no role whatsoever in the creation 12:28PM |
| 10  page 17 of Exhibit 314; correct, Mr Patil? 12:24PM | 10  of the LLDP standard; correct? 12:28PM |
| 11  A These are my words, yes 12:24PM | 11  A No. 12:28PM |
| 12  Q And you believed them to be true when you wrote 12:24PM | 12  Q And how did you first learn about LLDP? 12:28PM |
| 13  your thesis marked as Exhibit 314; correct? 12:24PM | 13  A When I was tasked to lead that project at Cisco. 12:28PM |
| 14  MR CANNON: Objection; calls for improper 12:24PM | 14  Q Who tasked you to lead that project at Cisco? 12:29PM |
| 15  opinion testimony, lacks foundation 12:24PM | 15  A My director. 12:29PM |
| 16  THE WITNESS: These are my words These are my 12:24PM | 16  Q Who was your director? 12:29PM |
| 17  opinions 12:25PM | 17  A Purnam Sheth. 12:29PM |
| 18  MR WONG: Yeah 12:25PM | 18  Q Can you spell that, please. 12:29PM |
| 19  Q Can you please provide me with a general 12:25PM | 19  A S-h-e-t-h is the last name, and first name is 12:29PM |
| 20  description of what "LLDP" is? 12:25PM | 20  P-u-r-n-a-m. 12:29PM |
| 21  A Yes Yes, I can 12:25PM | 21  Q And how did you learn about the LLDP standard, 12:29PM |
| 22  Q What -- what is "LLDP"? 12:25PM | 22  the -- the way it worked? 12:29PM |
| 23  A "LLDP" stands for Link Layer Discovery Protocol, 12:25PM | 23  A I -- upon being tasked with this -- with this 12:29PM |
| 24  and it is a -- at a high-level, it's a standardized way 12:25PM | 24  project, to lead this project, I did some initial 12:29PM |
| 25  for devices to discover each other and know of each 12:25PM | 25  research and it was very aggressive project at that 12:29PM |
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| | |
|---|---|
| 1  other. 12:25PM | 1  point, and so I -- yeah, I researched it actively and 12:29PM |
| 2  Q When you say it's a "standardized way for devices 12:25PM | 2  wanted to know as much of it as possible as early as 12:29PM |
| 3  to discover each other and know of each other," what do 12:26PM | 3  possible. 12:29PM |
| 4  you mean by a "standardized way"? 12:26PM | 4  Q When were you tasked with the LLDP project? 12:29PM |
| 5  A "Standardized" in the sense that it's a industry 12:26PM | 5  A Late 2005. 12:30PM |
| 6  standardized agreement and -- and ratified agreement on 12:26PM | 6  Q And what documents, if any, did you review to 12:30PM |
| 7  how a discovery can happen in a standardized way, and 12:26PM | 7  learn about the LLDP standard? 12:30PM |
| 8  it's meant in contrast with how proprietary discovery 12:26PM | 8  A I recall reviewing the very first version of the 12:30PM |
| 9  mechanisms can happen. 12:26PM | 9  RFC that they put out that was still not ratified, but 12:30PM |
| 10  Q When you say it's a "ratified agreement," what do 12:26PM | 10  there was an RFC and that -- that got me into it, yeah. 12:30PM |
| 11  you mean by "ratified"? 12:26PM | 11  Q Did you review the IEEE standard that related to 12:30PM |
| 12  A "Ratified" means something that has been -- 12:26PM | 12  LLDP? 12:30PM |
| 13  something that has withstood the test of time and has 12:26PM | 13  A Yes. 12:30PM |
| 14  been reviewed by several experts in the industry who -- 12:27PM | 14  MR. WONG: Let's mark this as 315, please. 12:30PM |
| 15  who have the ability to see that -- not just from a 12:27PM | 15  (Exhibit 315 was marked for 12:31PM |
| 16  feature perspective but also from a holistic perspective 12:27PM | 16  identification by the Court Reporter.) 12:31PM |
| 17  to see if it was actually viable -- viable to do that, 12:27PM | 17  MR. WONG: The Reporter has marked, as 12:31PM |
| 18  and then they collectively meet and discuss their 12:27PM | 18  Exhibit 315, document bearing control numbers 12:31PM |
| 19  concerns and refine the standard appropriately and then 12:27PM | 19  ARISTANDCA00017907 to 18078. 12:31PM |
| 20  agree on a version that is -- that can be considered 12:27PM | 20  Q Mr. Patil, do you recognize the document marked 12:31PM |
| 21  standard. 12:27PM | 21  as Exhibit 315? 12:31PM |
| 22  Q Do you know when LLDP was standardized? 12:27PM | 22  A I do. 12:31PM |
| 23  MR. CANNON: Objection; vague. 12:27PM | 23  Q And what is the document marked as Exhibit 315? 12:31PM |
| 24  THE WITNESS: The initial attempt, I think, from 12:27PM | 24  A This is the 802.1AB, which is the technical name 12:31PM |
| 25  late '90s to early -- to 2004 is when the standards 12:28PM | 25  for LLDP, and it's an IEEE standard that represents the 12:31PM |
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|---|---|
| 1 initial version of LLDP 12:31PM | 1 implement LLDP, was it just you who was involved in that 12:34PM |
| 2 Q And when was this IEEE standard approved? 12:31PM | 2 effort? 12:34PM |
| 3 A I don't recall the exact dates, but sometime in 12:31PM | 3 A I recall that the first three months were 12:34PM |
| 4 2007, is what I think the initial LLDP standard itself 12:32PM | 4 extremely aggressive, and I was the only one actually 12:34PM |
| 5 got approved 12:32PM | 5 taking the lead on it and doing everything -- all the 12:34PM |
| 6 Q Okay If you look at page 2 of 802 1AB -- excuse 12:32PM | 6 stages of it in the -- in the first three -- three 12:34PM |
| 7 me 12:32PM | 7 months, so, yes, in the first three months, but no after 12:35PM |
| 8 If you look at page 2 of Exhibit 315, there are 12:32PM | 8 that 12:35PM |
| 9 several dates there of -- of approval 12:32PM | 9 Q And after the first three months, who else was 12:35PM |
| 10 Do you see that? 12:32PM | 10 involved in the LLDP project at Cisco? 12:35PM |
| 11 A Page -- 12:32PM | 11 A A lot of the -- there are a lot of testing people 12:35PM |
| 12 Q I'm sorry, it's the second page of the actual 12:32PM | 12 who were -- who got involved, a lot of people from 12:35PM |
| 13 exhibit, not -- not the numbered page 2 12:32PM | 13 individual business units who wanted to sort of, for 12:35PM |
| 14 A Yeah, so second page here, copyrights -- I'm 12:32PM | 14 lack of a better term, acquire this technology for their 12:35PM |
| 15 looking at the physical second page 12:32PM | 15 platform Their engineers wanted to get involved, and 12:35PM |
| 16 Q Mm-hmm 12:32PM | 16 they there were also people in our own NSSTG that were 12:35PM |
| 17 A Is that what you mean? 12:32PM | 17 supporting me 12:35PM |
| 18 Q That's correct 12:32PM | 18 THE VIDEOGRAPHER: Counsel 12:35PM |
| 19 A This is page 1 and this is page 2 12:33PM | 19 MR WONG: Yes? 12:35PM |
| 20 Q That's right 12:33PM | 20 Why don't we take a break right now 12:36PM |
| 21 A So approved 28 June 2005 and approved March 2005, 12:33PM | 21 THE VIDEOGRAPHER: We are going off the record at 12:36PM |
| 22 yes 12:33PM | 22 12:35 p m This is the end of Media 2 12:36PM |
| 23 Q So does that match your recollection of when the 12:33PM | 23 (Lunch recess taken ) 12:36PM |
| 24 LLDP standard was approved? 12:33PM | 24 ---oOo--- 12:36PM |
| 25 A Approved, but not ratified and finalized 12:33PM | 25 |
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| | |
|---|---|
| 1 Q I see 12:33PM | 1 AFTERNOON SESSION 1:03 P M 12:36PM |
| 2 What's the difference between the approval of a 12:33PM | 2 12:36PM |
| 3 standard and the ratification and finalization of a 12:33PM | 3 (Exhibit 316 was marked for 12:36PM |
| 4 standard? 12:33PM | 4 identification by the Court Reporter ) 01:03PM |
| 5 MR CANNON: Objection; vague, lacks foundation 12:33PM | 5 THE VIDEOGRAPHER: We are on the record at 01:03PM |
| 6 THE WITNESS: I have not been in the standards 12:33PM | 6 1:01 -- 1:03 p m This is the beginning of Media 3 in 01:03PM |
| 7 bodies actively myself, and my understanding is the 12:33PM | 7 the deposition of Devadas Patil 01:03PM |
| 8 various phases of it leading up -- leading to the actual 12:33PM | 8 BY MR WONG: 01:03PM |
| 9 ratification whereby experts in that area of interest 12:33PM | 9 Q Welcome back from the break, Mr Patil 01:03PM |
| 10 agree on a certain standard 12:33PM | 10 A Thank you 01:03PM |
| 11 BY MR WONG: 12:33PM | 11 Q The Court Reporter has marked, during the break, 01:04PM |
| 12 Q And did you review the 802 1AB standard marked as 12:33PM | 12 as Exhibit 316, a document that's been placed in front 01:04PM |
| 13 Exhibit 315 while you were working on the LLDP 12:34PM | 13 of you 01:04PM |
| 14 project -- 12:34PM | 14 Do you see that? 01:04PM |
| 15 A That's correct -- 12:34PM | 15 A Yes 01:04PM |
| 16 Q -- for Cisco? 12:34PM | 16 Q And I'll represent to you, Mr Patil, that this 01:04PM |
| 17 A -- yes 12:34PM | 17 is a document that was provided to Arista's attorneys by 01:04PM |
| 18 Q Did you review the standard, or at least a draft 12:34PM | 18 Cisco's attorneys, and it lists -- it includes a table 01:04PM |
| 19 of the IEEE LLDP standard, in the course of Phase 1 of 12:34PM | 19 that has a list of commands on the left-side column 01:04PM |
| 20 the LLDP project? 12:34PM | 20 Do you see that? 01:04PM |
| 21 A That's correct 12:34PM | 21 A Yes 01:04PM |
| 22 Q Do you recall reviewing the IEEE LLDP standard 12:34PM | 22 Q Please take a moment, Mr Patil, and look at 01:04PM |
| 23 during the 2005 time period? 12:34PM | 23 Exhibit 316 and, in particular, the commands that are 01:04PM |
| 24 A Yes 12:34PM | 24 listed on the left-hand side of the table Let me know 01:04PM |
| 25 Q When you were tasked by your supervisor to 12:34PM | 25 when you are done 01:04PM |
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|---|---|
| 1   A   Okay. Yeah, I'm done.                01:04PM | 1  mentioned, did the LLDP project involve implementing     01:07PM |
| 2   Q   Do you understand that Cisco has identified you   01:04PM | 2  LLDP on those other operating systems?              01:07PM |
| 3   as the author or originator of the commands lifted --   01:04PM | 3   A   I was not aware of that               01:07PM |
| 4   listed on the left-side column of Exhibit 316?       01:05PM | 4   Q   Okay  So your personal involvement in Phase 1 of 01:07PM |
| 5   A   Yes.                       01:05PM | 5  the LLDP project focused only on implementing LLDP for   01:07PM |
| 6   Q   Okay. Now, are these commands listed in        01:05PM | 6  Cisco IOS; correct?                     01:08PM |
| 7   Exhibit 316 associated with the LLDP project that we     01:05PM | 7   A   Mm-hmm  Yeah                   01:08PM |
| 8   have been talking about this morning?           01:05PM | 8   Q   We mentioned -- strike that              01:08PM |
| 9   A   Yes.                       01:05PM | 9       You mentioned the different stages that were part 01:08PM |
| 10   Q   Were these commands added to Cisco IOS as part of 01:05PM | 10  of Phase 1 of the LLDP project              01:08PM |
| 11  Phase 1 of the LLDP project?             01:05PM | 11       Do you remember that?               01:08PM |
| 12   A   Yes. That's correct, yes.             01:05PM | 12   A   Yes                        01:08PM |
| 13   Q   Okay. You can set that aside for now, Mr. Patil. 01:05PM | 13   Q   Can you let me know -- strike that           01:08PM |
| 14       We were talking before the break about how you    01:05PM | 14       Can you list for me again the stages in the order  01 08PM |
| 15  became involved in the LLDP project.           01:05PM | 15  that they are handled?                   01:08PM |
| 16       Do you remember that?             01:05PM | 16       MR CANNON: Objection; asked and answered      01:08PM |
| 17   A   Mm-hmm.                   01:05PM | 17       THE WITNESS: It's market analysis, slash,       01:08PM |
| 18   Q   Were there particular Cisco products that the     01:05PM | 18  requirements as Stage 1  Architecture would be Stage 2  01:08PM |
| 19  LLDP implementation was going to apply to?        01:05PM | 19  Design would be Stage 3, and implementation and testing  01:08PM |
| 20   A   Yes.                       01:05PM | 20  would be Stages 4 and 5                 01:08PM |
| 21   Q   Okay. And I'm asking at the time that you       01:05PM | 21  BY MR  WONG:                   01:08PM |
| 22  started working on the LLDP project.            01:05PM | 22   Q   Testing is the fifth stage; correct?          01:08PM |
| 23       Do you understand?               01:05PM | 23   A   Yes                        01:08PM |
| 24   A   Mm-hmm.                   01:05PM | 24   Q   And it would go in that order, from Stage 1 to    01:08PM |
| 25   Q   What Cisco products were targeted for the LLDP   01:05PM | 25  Stage 2 to Stage 3 to Stage 4 to Stage 5; correct?    01:09PM |
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| | |
|---|---|
| 1  implementation at the start of Phase 1 of the project?  01:06PM | 1   A   Technically, yes, but in the interest of time,    01:09PM |
| 2   A   The initial rollout was for the Catalyst family   01:06PM | 2  some of these phases will -- stages will overlap.      01:09PM |
| 3  of enterprise switches, the Catalyst 6500, the       01:06PM | 3   Q   How long did Phase 1 of the LLDP project take to  01:09PM |
| 4  Catalyst 3000 series was soon to follow after that and,  01 06PM | 4  go from Stage 1 to Stage 5?               01:09PM |
| 5  later on, other platforms, including the SR1K, it opted  01:06PM | 5   A   I would say Stage 1 to Stage 5, roughly six      01:09PM |
| 6  the standard                     01:06PM | 6  months.                        01:09PM |
| 7   Q   When you say "later on, other platforms," what do 01:06PM | 7   Q   So it took six months to go from the          01:09PM |
| 8  you mean by "later on"?               01:06PM | 8  marketing/requirements stage all the way through the    01:09PM |
| 9   A   "Later on" as in the 2010-'11 time frame, yeah   01:06PM | 9  fifth testing stage for -- for Phase 1; correct?       01:09PM |
| 10   Q   Okay  So initially in 2005, though, what were    01:06PM | 10   A   Yes.                       01:09PM |
| 11  the targeted Cisco products for the LLDP implementation? 01:06PM | 11   Q   Which of the five stages consumed the most time   01:09PM |
| 12   A   The Catalyst switches           01:06PM | 12  out of those six months?                 01:09PM |
| 13   Q   And in terms of the operating system that the    01:06PM | 13   A   Architecture and design.              01:10PM |
| 14  LLDP implementation would apply to, was it just Cisco   01:07PM | 14   Q   Oh, Stages 2 and 3?               01:10PM |
| 15  IOS?                       01 07PM | 15   A   Yes.                       01:10PM |
| 16   A   Yes                       01:07PM | 16   Q   Did either architecture or design take more time  01:10PM |
| 17   Q   Okay  You are aware of other operating systems   01:07PM | 17  than the other?                     01:10PM |
| 18  that are used by other Cisco products?          01:07PM | 18   A   I would say architecture took -- took more than a  01:10PM |
| 19   A   I am                      01:07PM | 19  couple -- couple months to firm up.            01:10PM |
| 20   Q   What are the other operating systems that you are  01:07PM | 20   Q   So how many months or weeks -- strike that.      01:10PM |
| 21  aware of that are used by other Cisco products?      01:07PM | 21       How long, approximately, did it take for the      01:10PM |
| 22   A   The Cisco XR, Cisco ENA  I think it's been     01:07PM | 22  design stage of Phase 1 of the LLDP project to be      01:10PM |
| 23  renamed the NX-OS  There's also -- what do they call -- 01:07PM | 23  completed?                       01:10PM |
| 24  the software router, but those are the main ones      01:07PM | 24   A   About three and a half to four weeks.         01:10PM |
| 25   Q   And those other operating systems that you just   01:07PM | 25   Q   And what is part of the design stage for Phase 1  01:10PM |
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1 my reviewers' discussion, a good. I would say -- I mean,   01:16PM
2 if you just add up all the time phases, maybe three man   01:16PM
3 days to four man days   01:16PM
4 BY MR. WONG:   01:16PM
5   Q   And when you say "man days," you mean 9:00 to   01:16PM
6 5:00?   01:16PM
7   A   Yes   01:16PM
8   Q   Now, you testified, before the break, that you   01:16PM
9 had reviewed the IEEE LLDP standard that we marked as   01:17PM
10 Exhibit 315 sometime in 2005   01:17PM
11       Do you remember that testimony?   01:17PM
12   A   Yes   01:17PM
13   Q   During what stage of Phase 1 of the LLDP project   01:17PM
14 did you review the IEEE LLDP standard?   01:17PM
15   A   Mainly in the market analysis and architecture   01:17PM
16 phases   01:17PM
17   Q   So those would be Phases 1 and -- excuse me,   01:17PM
18 those would be Stages 1 and 2?   01:17PM
19   A   Yes   01:17PM
20   Q   And did you review the IEEE LLDP standard from   01:17PM
21 front to back?   01:17PM
22   A   I made a full attempt to do that, yes   I don't   01:17PM
23 know if I reviewed every word of it, but   01:17PM
24   Q   And you made a full attempt to review the   01:17PM
25 complete IEEE LLDP standard before moving on to the   01:17PM

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1 design stage of Phase 1 of the LLDP project; correct?   01:17PM
2       MR. CANNON: Objection; vague   01:18PM
3       THE WITNESS: Yes   I mean, I didn't read the --   01:18PM
4 each cell of the table, but from a general understanding   01:18PM
5 and the main concepts, yes   01:18PM
6 BY MR. WONG:   01:18PM
7   Q   Why was it important to review as much of the   01:18PM
8 IEEE LLDP standard as possible before moving on to the   01:18PM
9 design stage of Phase 1 of the LLDP project?   01:18PM
10       MR. CANNON: Objection; vague, assumes facts not   01:18PM
11 in evidence, mischaracterizes testimony   01:18PM
12       THE WITNESS: Because we wanted to do a very   01:18PM
13 solid job of the architecture, and, fundamentally, we   01:18PM
14 were, from an architecture standpoint, trying to   01:18PM
15 understand how they should co-exist with CDP   01:18PM
16 BY MR. WONG:   01:18PM
17   Q   And what is "CDP"?   01:18PM
18   A   Oh, Cisco Discovery Protocol   01:18PM
19   Q   And was Cisco Discovery Protocol an   01:18PM
20 industry-standardized protocol?   01:19PM
21   A   No   01:19PM
22   Q   What was it, then?   01:19PM
23   A   Cisco proprietary discovery protocol   01:19PM
24   Q   What's the difference between a   01:19PM
25 industry-standardized protocol like LLDP and a   01:19PM

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1 proprietary protocol like CDP?   01:19PM
2       MR. CANNON: Objection; vague, lacks foundation,   01:19PM
3 and calls for improper opinion testimony.   01:19PM
4       MR. WONG: Let me -- let me take a step back   01:19PM
5 here.   01:19PM
6   Q   You are -- you are familiar with CDP; correct?   01:19PM
7   A   Yes.   01:19PM
8   Q   And you -- you were familiar with CDP from your   01:19PM
9 time working at Cisco; correct?   01:19PM
10   A   Yes. Yes.   01:19PM
11   Q   What type of experience did you have working with   01:19PM
12 CDP from your employment at Cisco?   01:19PM
13   A   I -- before getting into this project, I didn't   01:19PM
14 have a lot of opportunity or need to work with CDP. I   01:19PM
15 know that it existed, and after I got tasked with this,   01:19PM
16 I -- I -- I looked at it and got deeper knowledge of it   01:19PM
17 and understood that it is a proprietary protocol and we   01:19PM
18 are standardizing it in LLDP and -- yeah.   01:20PM
19   Q   And so during what stage of the five stages that   01:20PM
20 we have been talking about for Phase 1 of the LLDP   01:20PM
21 project did you look at Cisco's implementation of CDP?   01:20PM
22   A   The first three.   01:20PM
23   Q   And what did you -- what did you review to get up   01:20PM
24 to speed on Cisco's implementation of CDP?   01:20PM
25   A   I -- I looked at the code.   I looked at the   01:20PM

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1 specifications, and I probably discussed with the   01:20PM
2 original developer for it, and that's about what I must   01:20PM
3 have done, yeah.   01:20PM
4   Q   Is LLDP based at all on CDP, to your knowledge?   01:20PM
5       MR. CANNON: Objection; vague, lacks foundation,   01:20PM
6 calls for improper opinion testimony.   01:21PM
7       THE WITNESS: It's very similar, and I -- it's   01:21PM
8 certainly heavily influenced by CDP, but I -- I -- I   01:21PM
9 would be wrong to say that it is based on CDP.   01:21PM
10 BY MR. WONG:   01:21PM
11   Q   What are the similarities between CDP and LLDP,   01:21PM
12 to your knowledge?   01:21PM
13       MR. CANNON: Objection; vague, lacks foundation,   01:21PM
14 and calls for improper opinion testimony.   01:21PM
15       THE WITNESS: The mechanics of it, meaning we   01:21PM
16 send it -- there is a frequency of keep-alive messages.   01:21PM
17 There is a frequency of initial discovery as opposed to   01:21PM
18 a push button, one point say -- message saying, hey, I'm   01:21PM
19 alive, and until I send another message that I'm not   01:21PM
20 alive, don't even bother.   01:21PM
21       There are various paradigms of how this can be   01:21PM
22 done, right? So in that respect, it's -- it's similar,   01:21PM
23 and that's how it influences the -- the standard   01:22PM
24 protocol in LLDP.   01:22PM
25 BY MR. WONG:   01:22PM

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34 (Pages 130 - 133)

1　Q　Did you come up with the term "neighbors" in the 01:32PM
2　sense of discovery?　01:32PM
3　A　No.　01:32PM
4　Q　Where did the term "neighbors" come from as used 01:32PM
5　in the sense of discovery?　01:32PM
6　　MR. CANNON: Objection; lacks foundation.　01:32PM
7　BY MR. WONG:　01:32PM
8　Q　If you know.　01:32PM
9　A　More from intuition, more from just being able to 01:32PM
10　communicate it correctly.　01:32PM
11　Q　Communicate it correctly to who -- strike that.　01:32PM
12　　Communicate it directly to who?　01:32PM
13　A　The reviewers, the -- the reviewers and people　01:32PM
14　who will give me suggestions on where -- what -- what to 01:32PM
15　change or how to improve it.　01:33PM
16　Q　Why is it that a non-Cisco device cannot interact 01:33PM
17　with a Cisco device in the process of discovering each 01:33PM
18　other as neighbors, as you say here on page 3 of　01:33PM
19　Exhibit 317?　01:33PM
20　　MR. CANNON: Objection; vague, incomplete　01:33PM
21　hypothetical, calls for improper opinion testimony,　01:33PM
22　lacks foundation.　01:33PM
23　　THE WITNESS: Because the existing protocols back 01:33PM
24　then were proprietary. Cisco had its own proprietary　01:33PM
25　protocol for discovery. Model [phonetic] had its own　01:33PM

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1　and there is no right answer for this, but my personal　01:34PM
2　opinion is a yes.　01:34PM
3　BY MR. WONG:　01:34PM
4　Q　And why is that important, Mr. Patil?　01:34PM
5　　MR. CANNON: Same objections.　01:34PM
6　　THE WITNESS: My personal opinion is that devices 01:34PM
7　should freely discover each other and collaborate to　01:35PM
8　bring about functionality, and that's the reason they　01:35PM
9　should be -- there should be a standard.　01:35PM
10　BY MR. WONG:　01:35PM
11　Q　And when you say devices should be able to freely 01:35PM
12　discover each other, you are referring to devices from　01:35PM
13　different vendors; correct?　01:35PM
14　A　That's correct.　01:35PM
15　Q　And the only way that you can have devices from　01:35PM
16　different vendors to freely discover each other, as you　01:35PM
17　say, would be to have a standard to do that; correct?　01:35PM
18　　MR. CANNON: Objection; vague, lacks foundation, 01:35PM
19　calls for improper opinion testimony.　01:35PM
20　　THE WITNESS: That's correct.　01:35PM
21　BY MR. WONG:　01:35PM
22　Q　And, finally, the last sentence in this　01:35PM
23　paragraph, top of page 3 of Exhibit 317, says, "LLDP was 01:35PM
24　standardized by IEEE as part of 802.1ab, and Cisco's　01:35PM
25　implementation will be based on this standard."　01:35PM

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1　proprietary protocol for discovery, and they don't talk 01:33PM
2　to each other. That's what I meant.　01:33PM
3　BY MR. WONG:　01:33PM
4　Q　And the next sentence in this paragraph, you　01:33PM
5　wrote: "Thus there is a need for Cisco devices to　01:33PM
6　comply with an industry standard for network topology　01:33PM
7　discovery."　01:33PM
8　　Do you see that?　01:33PM
9　A　Yes.　01:33PM
10　Q　Why is there a need for Cisco devices to comply　01:33PM
11　with an industry standard for network topology　01:33PM
12　discovery, as you wrote in Exhibit 317?　01:34PM
13　　MR. CANNON: Objection; vague, lacks foundation, 01:34PM
14　calls for improper opinion testimony.　01:34PM
15　　THE WITNESS: The answer is in the very previous 01:34PM
16　sentence for that, yeah. Basically says that a　01:34PM
17　non-Cisco device cannot interact with a Cisco device in 01:34PM
18　the process of discovery.　01:34PM
19　BY MR. WONG:　01:34PM
20　Q　Is it important for a non-Cisco device to be able 01:34PM
21　to interact with a Cisco device in the process of　01:34PM
22　discovering each other as neighbors?　01:34PM
23　　MR. CANNON: Objection; vague, lacks foundation, 01:34PM
24　calls for improper opinion testimony.　01:34PM
25　　THE WITNESS: This is an architectural question, 01:34PM

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1　　Do you see that?　01:35PM
2　A　Yes　01:35PM
3　Q　Right　01:35PM
4　　This 802.1AB that you are referring to in　01:35PM
5　Exhibit 317 is the same standard marked as Exhibit 315 01:36PM
6　here; correct?　01:36PM
7　A　That's correct　01:36PM
8　Q　Okay And is it correct that Cisco's　01:36PM
9　implementation of LLDP was based upon the IEEE standard 01:36PM
10　marked as Exhibit 315?　01:36PM
11　　MR CANNON: Objection; vague　01:36PM
12　　THE WITNESS: It is based upon that, right　01:36PM
13　BY MR WONG:　01:36PM
14　Q　And that was intentional; correct?　01:36PM
15　　MR CANNON: Objection; vague　01:36PM
16　　MR WONG: Let me rephrase the question　01:36PM
17　Q　When you were working on implementing LLDP in　01:36PM
18　Cisco's devices, you intended for the implementation to 01:36PM
19　follow the IEEE standard marked as Exhibit 315; correct? 01:36PM
20　　MR CANNON: Objection; vague　01:36PM
21　　THE WITNESS: Correct　01:36PM
22　BY MR WONG:　01:36PM
23　Q　You intended Cisco's implementation of LLDP to be 01:36PM
24　compliant with the IEEE standard marked as Exhibit 315; 01:36PM
25　right?　01:37PM

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37 (Pages 142 - 145)

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| | |
|---|---|
| 1 A Compliant with, yes 01:37PM | 1 that with one -- with just one vendor's equipment just 01:40PM |
| 2 Q In the third paragraph on page 3 of Exhibit 317, 01:37PM | 2 to make SNMP work, and that level of interoperability at 01:40PM |
| 3 first sentence says, "LLDP facilitates the use of 01:37PM | 3 the SNMP level can be very handy in -- in -- in larger 01:40PM |
| 4 standard management tools such as SNMP in a multi-vendor 01:37PM | 4 networks. 01:40PM |
| 5 network " 01:37PM | 5 BY MR. WONG: 01:40PM |
| 6 Do you see that? 01:37PM | 6 Q If there wasn't the standardization for SNMP 01:40PM |
| 7 A Yes 01:37PM | 7 inquiries and you had a multivendor network, would you 01:40PM |
| 8 Q What do you mean by that statement? 01:37PM | 8 have to write different SNMP inquiries for each network? 01:40PM |
| 9 A So the answer to that might get a little 01:37PM | 9 MR. CANNON: Objection; vague, incomplete 01:41PM |
| 10 technical, but I'll say that anyway 01:37PM | 10 hypothetical, lacks foundation, calls for improper 01:41PM |
| 11 Part of the IEEE standard is also a specification 01:37PM | 11 opinion testimony. 01:41PM |
| 12 of topology Management Information Base, which can be 01:37PM | 12 THE WITNESS: If that were the case, then -- then 01:41PM |
| 13 developed to make SNMP queries, so if the Management 01:37PM | 13 we are -- we are essentially talking of vendor-specific 01:41PM |
| 14 Information Base can be standard across all vendors, 01:37PM | 14 Management Information Bases, and that would, at the 01:41PM |
| 15 that means that the SNMP queries will apply universally 01:38PM | 15 very least, at least require some level of nonstandard 01:41PM |
| 16 across all vendors, and that's the -- the added 01:38PM | 16 or tailored queries for each vendor. 01:41PM |
| 17 advantage of standardizing this 01:38PM | 17 BY MR. WONG: 01:41PM |
| 18 Q And what is "SNMP"? 01:38PM | 18 Q If you turn back to Exhibit 315, it's the IEEE 01:42PM |
| 19 A It -- it stands for Simple Network Management 01:38PM | 19 standard for LLDP. 01:42PM |
| 20 Protocol 01:38PM | 20 A Yes. 01:42PM |
| 21 Q And how was -- what's the function or purpose of 01:38PM | 21 Q Now, LLDP is a defined term in the IEEE standard; 01:42PM |
| 22 SNMP? 01:38PM | 22 correct? 01:42PM |
| 23 MR CANNON: Objection; vague 01:38PM | 23 A Yes. 01:42PM |
| 24 THE WITNESS: The purpose of SNMP is to, 01:38PM | 24 Q In fact, if you look to page 5 of -- and I'm 01:42PM |
| 25 essentially, allow network administrators and engineers 01:38PM | 25 looking -- pointing to page 5 at the bottom of the page 01:42PM |
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| | |
|---|---|
| 1 and developers to be able to create network information 01:38PM | 1 of Exhibit 315, there is a section on the top that it 01:42PM |
| 2 and send -- send trap -- what are called -- technically 01:38PM | 2 says "Definitions and numerical representation " 01:42PM |
| 3 called "traps," SNMP traps, to signal significant events 01:39PM | 3 Do you see that? 01:42PM |
| 4 in a network. And it's a protocol that persists network 01:39PM | 4 A Yes 01:42PM |
| 5 information in a -- in a place called MIB, Management 01:39PM | 5 Q And entry 3 1 6 -- 01:42PM |
| 6 Information Base, and then provides a user interface 01:39PM | 6 A Yes 01:42PM |
| 7 to -- to query that data. 01:39PM | 7 Q -- defines Link Layer Discovery Protocol and, in 01:42PM |
| 8 BY MR. WONG: 01:39PM | 8 parentheses, LLDP 01:42PM |
| 9 Q And I think you said that if the Management 01:39PM | 9 Do you see that? 01:42PM |
| 10 Information Base, or MIB, can be standard across all 01:39PM | 10 A Mm-hmm 01:42PM |
| 11 vendors, that means that the SNMP inquiries [sic] will 01:39PM | 11 Q So you were aware that LLDP was a defined acronym 01:42PM |
| 12 apply universally across all vendors; right? 01:39PM | 12 in the actual IEEE standard while you were working on 01:43PM |
| 13 A Yes. 01:39PM | 13 Phase 1 of the LLDP project; correct? 01:43PM |
| 14 Q So that means that a network administrator and 01:39PM | 14 MR CANNON: Objection: vague 01:43PM |
| 15 engineers can use the same SNMP inquiries for different 01:39PM | 15 THE WITNESS: Yes 01:43PM |
| 16 vendor products; correct? 01:39PM | 16 BY MR WONG: 01:43PM |
| 17 A Correct, if they are connect -- interconnected. 01:39PM | 17 Q If you turn the page to page 6 -- 01:43PM |
| 18 Q And what's the advantage of -- what's the 01:39PM | 18 A Mm-hmm 01:43PM |
| 19 advantage to a network administrator to be able to use 01:40PM | 19 Q -- entry 3 1 21 01:43PM |
| 20 the same SNMP inquiries for different vendor products? 01:40PM | 20 Do you see that? 01:43PM |
| 21 MR. CANNON: Objection; vague, lacks foundation, 01:40PM | 21 A Yes 01:43PM |
| 22 calls for improper opinion testimony. 01:40PM | 22 Q It says, "type, length, value (TLV) " 01:43PM |
| 23 THE WITNESS: If a certain topology or deployment 01:40PM | 23 Do you see that? 01:43PM |
| 24 includes multiple -- inputs equipment from multiple 01:40PM | 24 A Yes 01:43PM |
| 25 vendors, they don't have to tear that apart and replace 01:40PM | 25 Q You were aware, by Stage 1 or at least Stage 2 of 01:43PM |
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1 Phase 1 of the LLDP project, that the IEEE standard for   01:43PM
2 LLDP defined the acronym TLV; correct?   01:43PM
3      MR. CANNON: Objection; vague, mischaracterizes   01:43PM
4 the document.   01:43PM
5      THE WITNESS: Yes.   01:43PM
6 BY MR. WONG:   01:43PM
7   Q   In fact, on page 7 of Exhibit 315, at the very   01:43PM
8 top, it's a section called "Acronyms and abbreviations";   01:43PM
9 correct?   01:43PM
10   A   Yes.   01:43PM
11   Q   And both LLDP and TLV are listed as defined   01:43PM
12 acronyms within the IEEE LLDP standard; right?   01:43PM
13   A   Yes.   01:44PM
14   Q   And you were aware of that before you began the   01:44PM
15 design stage for Phase 1 of the LLDP project; right?   01:44PM
16   A   Yes.   01:44PM
17   Q   And you were aware of that during the design   01:44PM
18 period for the LLDP project; correct?   01:44PM
19   A   Yes.   01:44PM
20   Q   And if you look at Exhibit 316, which is this   01:44PM
21 list of commands?   01:44PM
22   A   Okay.   01:44PM
23   Q   Are you there?   01:44PM
24      Each of the commands associated with you include   01:44PM
25 the acronym LLDP.   01:44PM

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1      Do you see that?   01:44PM
2   A   Yes   01:44PM
3   Q   That LLDP is the same LLDP that is defined within   01:44PM
4 the IEEE LLDP standard; right?   01:44PM
5      MR CANNON: Objection; vague   01:44PM
6      THE WITNESS: It's -- yeah, it -- it refers to   01:44PM
7 the Link Layer Discovery Protocol   01:44PM
8 BY MR WONG:   01:45PM
9   Q   I mean, that's the same acronym that appears here   01:45PM
10 on page 7 of Exhibit 315; right? Under "Acronyms and   01:45PM
11 abbreviations" within the IEEE standard; correct?   01:45PM
12      MR CANNON: Objection; documents speak for   01:45PM
13 themselves   01:45PM
14      THE WITNESS: Yes   01:45PM
15 BY MR WONG:   01:45PM
16   Q   And your choice of LLDP in each of the commands   01:45PM
17 listed on Exhibit 316, that was intentionally meant to   01:45PM
18 refer to the LLDP acronym within the IEEE standard;   01:45PM
19 right?   01:45PM
20      MR CANNON: Objection; vague   01:45PM
21      THE WITNESS: Yes   01:45PM
22 BY MR WONG:   01:45PM
23   Q   If you look at Section 10 3 4 of Exhibit 315 --   01:45PM
24 let me know when you are there   01:45PM
25      MR CANNON: Do you have the page number for   01:45PM

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1 that?   01:45PM
2      MR. WONG: I'll tell you once I see it. Yes,   01:45PM
3 page 39. Control number is -- ends in 17959.   01:46PM
4   Q   Are you there?   01:46PM
5   A   Yeah, I am.   01:46PM
6   Q   So Section 10.3.4 is called "Too many neighbors."   01:46PM
7      Do you see that?   01:46PM
8   A   Mm-hmm.   01:46PM
9   Q   Now, we were talking earlier about the use of the   01:46PM
10 word "neighbors" in the functional specification that   01:46PM
11 you wrote --   01:46PM
12   A   Yes.   01:46PM
13   Q   -- right?   01:46PM
14   A   Yes.   01:46PM
15   Q   Is this use of the word "neighbors" here in the   01:46PM
16 IEEE specification the -- the same use of the word   01:46PM
17 "neighbors" that you were using in the functional   01:46PM
18 specification?   01:46PM
19      MR. CANNON: Objection; vague.   01:46PM
20      THE WITNESS: I was -- I read this specification   01:46PM
21 thoroughly, so I -- yeah, I was influenced by some of   01:46PM
22 the language in here.   01:47PM
23 BY MR. WONG:   01:47PM
24   Q   But you -- you became familiar with the   01:47PM
25 terminology relevant to LLDP by reading the IEEE   01:47PM

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1 standard on LLDP; right?   01:47PM
2      MR. CANNON: Objection; vague.   01:47PM
3      THE WITNESS: Yes.   01:47PM
4 BY MR. WONG:   01:47PM
5   Q   And in particular here, you were aware that the   01:47PM
6 term "neighbors" was used in the IEEE LLDP standard;   01:47PM
7 right?   01:47PM
8   A   Mm-hmm.   01:47PM
9      MR. CANNON: Objection; vague.   01:47PM
10 BY MR. WONG:   01:47PM
11   Q   Oh, I'm sorry, can you -- let me -- let me ask   01:47PM
12 the question one more time.   01:47PM
13      And in particular here, Section 10.3.4 of   01:47PM
14 Exhibit 315, you were aware that the term "neighbors"   01:47PM
15 was used in the IEEE LLDP standard, yes?   01:47PM
16      MR. CANNON: Objection; vague.   01:47PM
17      THE WITNESS: Yes.   01:47PM
18 BY MR. WONG:   01:47PM
19   Q   Can you turn to page -- or Section 5.2, please,   01:48PM
20 of Exhibit 315, and that is page 8.   01:48PM
21      Are you there?   01:48PM
22   A   Yes.   01:48PM
23   Q   Section 5.2 on page 8 of Exhibit 315 says   01:48PM
24 "Required capabilities."   01:48PM
25      Do you see that?   01:48PM

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| | |
|---|---|
| 1 A Yes     01:48PM | 1 Q So the LLDP implementation that you worked on at 01:50PM |
| 2 Q And under that, it says, "A system for which 01:48PM | 2 Cisco -- and, in particular, Phase 1 -- supported a 01:50PM |
| 3 conformance to this standard is claimed shall, for all 01:48PM | 3 transmit-only operating mode?     01:50PM |
| 4 ports for which support is claimed, include the 01:48PM | 4 A Yes. I don't recall the -- I don't remember it 01:51PM |
| 5 following capabilities," and then it lists items a 01:48PM | 5 very clearly, but, yes.     01:51PM |
| 6 through k     01:48PM | 6 Q Okay. And did it also support a receive only -- 01:51PM |
| 7    Do you see that?     01:48PM | 7 excuse me.     01:51PM |
| 8 A Yes     01:48PM | 8    Did it also support a receive-only operating 01:51PM |
| 9    MR CANNON: Objection; mischaracterizes the 01:48PM | 9 mode?     01:51PM |
| 10 document     01:48PM | 10    MR. CANNON: Objection; vague, lacks foundation. 01:51PM |
| 11 BY MR WONG:     01:48PM | 11    THE WITNESS: Let me take a moment. Yes. 01:51PM |
| 12 Q Did I read that correctly, Mr Patil? 01:48PM | 12 BY MR. WONG:     01:51PM |
| 13    MR CANNON: Objection; mischaracterizes the 01:48PM | 13 Q And did it also support a transmit and receive 01:51PM |
| 14 document     01:48PM | 14 operating mode?     01:51PM |
| 15    THE WITNESS: You did     01:48PM | 15    MR. CANNON: Objection; vague, lacks foundation. 01:51PM |
| 16 BY MR WONG:     01:48PM | 16    THE WITNESS: Yes.     01:51PM |
| 17 Q And did the Cisco products for which you worked 01:49PM | 17 BY MR. WONG:     01:51PM |
| 18 on the LLDP implementation conform to the standard 01:49PM | 18 Q And each of those features that we just talked 01:51PM |
| 19 marked as Exhibit 315?     01:49PM | 19 about, those were implemented as part of Phase 1 of the 01:51PM |
| 20    MR CANNON: Objection; vague, lacks foundation, 01:49PM | 20 LLDP project that you worked on, Mr. Patil? 01:51PM |
| 21 calls for improper opinion testimony     01:49PM | 21    MR. CANNON: Objection; vague.     01:51PM |
| 22    MR WONG: Let me rephrase the question 01:49PM | 22    THE WITNESS: Yes.     01:51PM |
| 23 Q Were the required capabilities listed in 01:49PM | 23 BY MR. WONG:     01:51PM |
| 24 Section 5 2 of Exhibit 315 implemented when you did the 01:49PM | 24 Q If you turn to page 43 of Exhibit 315 -- let me 01:52PM |
| 25 LLDP implementation for Cisco's products? 01:49PM | 25 know when you are there.     01:52PM |
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| | |
|---|---|
| 1    MR CANNON: Objection; vague, compound, lacks 01:49PM | 1 A Yes     01:52PM |
| 2 foundation, and calls for improper opinion testimony 01:49PM | 2 Q -- section 10 5 2 is called "Statistical 01:52PM |
| 3    THE WITNESS: I don't know how many are specific 01:49PM | 3 counters "     01:52PM |
| 4 deal with are implemented, but the focus was to be as 01:49PM | 4    Do you see that?     01:52PM |
| 5 compliant as possible     01:49PM | 5 A Yes     01:52PM |
| 6 BY MR WONG:     01:49PM | 6 Q And, under that, it says, "Statistical counters 01:52PM |
| 7 Q If you look at subsection i under Section 5 2 -- 01:49PM | 7 shall be provided to accumulate operational statistics 01:52PM |
| 8 A Yes     01:50PM | 8 on a per-port basis "     01:52PM |
| 9 Q -- it says, "The protocol shall conform to the 01:50PM | 9    Do you see that?     01:52PM |
| 10 specifications for all Clause 10 subclauses indicated in 01:50PM | 10 A Yes     01:52PM |
| 11 Table 10-1 for the particular operating mode," and then 01:50PM | 11 Q Is it your understanding that the support of 01:52PM |
| 12 in parentheses it has "transmit only, receive only, or 01:50PM | 12 statistical counters is required by the IEEE LLDP 01:52PM |
| 13 transmit and receive," close parentheses, "being 01:50PM | 13 standard?     01:52PM |
| 14 implemented "     01:50PM | 14    MR CANNON: Objection; vague, lacks foundation, 01:52PM |
| 15    Do you see that?     01:50PM | 15 calls for improper opinion testimony     01:52PM |
| 16 A Yes     01:50PM | 16    THE WITNESS: Can you repeat the question again? 01:52PM |
| 17 Q Did I read that correctly?     01:50PM | 17    MR WONG: Sure     01:52PM |
| 18 A Yes     01:50PM | 18 Q Is it your understanding that providing 01:52PM |
| 19 Q Did the LLDP implementation that you worked on at 01:50PM | 19 statistical counters is a requirement of complying with 01:52PM |
| 20 Cisco include this capability described by subsection i 01:50PM | 20 the IEEE LLDP standard?     01:53PM |
| 21 under Section 5 2?     01:50PM | 21    MR CANNON: Same objections     01:53PM |
| 22    MR CANNON: Objection; vague, lacks foundation, 01:50PM | 22    THE WITNESS: Yes     01:53PM |
| 23 calls for improper opinion testimony     01:50PM | 23 BY MR WONG:     01:53PM |
| 24    THE WITNESS: Yes, it included     01:50PM | 24 Q And did you, in fact, support statistical 01:53PM |
| 25 BY MR WONG:     01:50PM | 25 counters when you worked on the LLDP implementation at 01:53PM |
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| | |
|---|---|
| 1 Cisco? 01:53PM | 1 Do you see that? 01:56PM |
| 2 MR CANNON: Same objections 01:53PM | 2 A Yes. 01:56PM |
| 3 THE WITNESS: Yes 01:53PM | 3 Q What are "MIB tables"? 01:56PM |
| 4 BY MR WONG: 01:53PM | 4 A So "MIB tables" are the -- the storage that make 01:56PM |
| 5 Q Now, you were looking at Exhibit 316 while you 01:53PM | 5 SNMP queries possible, so MIBs are -- essentially 01:56PM |
| 6 were confirming your answer; correct? 01:53PM | 6 support information for SNMP. 01:56PM |
| 7 A That's correct 01:53PM | 7 Q And so are -- are the tables different from the 01:56PM |
| 8 Q What -- what were you looking for in Exhibit 316 01:53PM | 8 MIBs themselves? 01:56PM |
| 9 to confirm your answer? 01:53PM | 9 A MIBs -- MIB tables are like the blueprint for the 01:56PM |
| 10 MR CANNON: Objection; mischaracterizes 01:53PM | 10 actual tables -- I'm sorry, MIB tables are the blueprint 01:56PM |
| 11 testimony 01:53PM | 11 for the actual MIB data, if that makes sense. 01:56PM |
| 12 THE WITNESS: I was looking at the CLI I 01:53PM | 12 Q MIB tables -- I'm sorry, can you explain that? 01:56PM |
| 13 vaguely recalled that I supported that, but I was 01:53PM | 13 So let me -- let me ask the question again. 01:57PM |
| 14 looking at the -- the list of CLIs here to -- to confirm 01:53PM | 14 How -- strike that. 01:57PM |
| 15 that it -- it was in Phase 1 01:54PM | 15 Are tables different from the MIBs themselves? 01:57PM |
| 16 BY MR WONG: 01:54PM | 16 A In -- in the -- and I have not used this language 01:57PM |
| 17 Q And which CLI command did you look at to confirm 01:54PM | 17 for a long time, and I've not used SNMP in a long time, 01:57PM |
| 18 that the support of counters was included in Phase 1 of 01:54PM | 18 but my understanding is that the language of SNMP -- in 01:57PM |
| 19 the LLDP project? 01:54PM | 19 the language of SNMP, the MIB table is like a blueprint. 01:57PM |
| 20 MR CANNON: Objection; vague, mischaracterizes 01:54PM | 20 It's called the data that is housed in the MIB. 01:57PM |
| 21 testimony 01:54PM | 21 Q And the -- the term "MIB table," that -- is that 01:57PM |
| 22 THE WITNESS: I just confirmed that "show lldp 01:54PM | 22 a term that is familiar to those in networking industry? 01:57PM |
| 23 traffic" does exist in this table so that I can answer 01:54PM | 23 MR. CANNON: Objection; vague, lacks foundation, 01:57PM |
| 24 you 01:54PM | 24 calls for improper opinion testimony. 01:57PM |
| 25 BY MR WONG: 01:54PM | 25 THE WITNESS: Yes. 01:57PM |
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| | |
|---|---|
| 1 Q If you turn to page 49 of Exhibit 315 -- let me 01:54PM | 1 BY MR. WONG: 01:57PM |
| 2 know when you are there. 01:54PM | 2 Q And you certainly know what a "MIB table" is if 01:57PM |
| 3 A Yes. 01:54PM | 3 you heard that term used; correct? 01:58PM |
| 4 Q -- if you look under Section 11.2.2, it's called 01:54PM | 4 A Yes. 01:58PM |
| 5 "TLV selection management." 01:54PM | 5 Q And you would understand what a "MIB table" is 01:58PM |
| 6 Do you see that? 01:54PM | 6 based upon your experience working in the networking 01:58PM |
| 7 A Yes. 01:54PM | 7 industry; correct? 01:58PM |
| 8 Q What is "TLV selection management"? 01:54PM | 8 A Yes. 01:58PM |
| 9 A So some of the data that is sent in a discovery 01:54PM | 9 Q What was the process at Cisco for selecting a 01:58PM |
| 10 packet is mandatory, and some of it is optional, and 01:55PM | 10 command syntax? And we can talk specifically about the 01:58PM |
| 11 what the standard calls for is the ability to specify 01:55PM | 11 commands listed on Exhibit 316 -- 01:58PM |
| 12 which of the optional TLVs the admin wants to send on a 01:55PM | 12 A Mm-hmm. 01:58PM |
| 13 particular port or suppress on a particular port, so 01:55PM | 13 Q -- but -- so let me just rephrase the question, 01:58PM |
| 14 that's what TLV selection management essentially means. 01:55PM | 14 actually. 01:58PM |
| 15 Q And when you worked on Phase 1 of the LLDP 01:55PM | 15 For the commands listed in Exhibit 316, what was 01:58PM |
| 16 project at Cisco, did you include the ability for TLV 01:55PM | 16 the process at Cisco for selecting the command syntax? 01:58PM |
| 17 selection in that implementation? 01:55PM | 17 MR. CANNON: Objection; vague, lacks foundation, 01:58PM |
| 18 A Yes. 01:55PM | 18 calls for speculation. 01:58PM |
| 19 Q In that first paragraph below Section 11.2.2 in 01:55PM | 19 THE WITNESS: Well, there is -- the -- the 01:58PM |
| 20 Exhibit 315 -- 01:56PM | 20 product owner, which is me, lead developer for the 01:58PM |
| 21 A Mm-hmm. 01:56PM | 21 product, comes up with initial proposal, and it is, 01:58PM |
| 22 Q -- the second sentence says, "The following LLDP 01:56PM | 22 essentially, reviewed by a group of people that are 01:58PM |
| 23 variables cross reference to LLDP local systems 01:56PM | 23 highly experienced for -- for usability and 01:59PM |
| 24 configuration MIB tables," and then it -- there's a 01:56PM | 24 extensibility, and so on, so there are certain criteria 01:59PM |
| 25 remainder of the sentence. 01:56PM | 25 that they look -- look at, including usability, 01:59PM |
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1  subcommands under certain -- at certain places, and  02:16PM

2  that -- that's -- that's what it means  02:16PM

3  Q  And why is that important when coming up with a  02:16PM

4  command syntax?  02:16PM

5  MR CANNON: Objection; vague, lacks foundation,  02:16PM

6  incomplete hypothetical, calls for improper opinion  02:16PM

7  testimony  02:16PM

8  THE WITNESS: To support extensibility in -- in  02:16PM

9  general in the sense that we might do certain things in  02:17PM

10  Phase 1 and we might plan to include more commands at a  02:17PM

11  certain level in -- in the command hierarchy at a later  02:17PM

12  phase, and that is if you know you already want to do  02:17PM

13  that  But sometimes we don't even know, and it's all  02:17PM

14  the more pressing at that point to -- for -- for it to  02:17PM

15  be designed for extensibility  02:17PM

16  BY MR  WONG:  02:17PM

17  Q  Did you consider extensibility when you were  02:17PM

18  proposing the command syntaxes for the commands listed  02:17PM

19  on Exhibit 316?  02:17PM

20  MR  CANNON: Objection; vague  02:17PM

21  THE WITNESS: Definitely, yes  02:17PM

22  BY MR  WONG:  02:17PM

23  Q  If you turn to page 4 of Exhibit 318, No  6 --  02:17PM

24  let me know when you are there  02:18PM

25  A  Okay  02:18PM

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1  Q  -- it says, "When naming a command, try to pick  02:18PM

2  names that would be familiar to people in the industry "  02:18PM

3  Do you see that?  02:18PM

4  A  Yes  02:18PM

5  Q  When you came up with the commands listed on  02:18PM

6  Exhibit 316, did you try to pick names that would be  02:18PM

7  familiar to people in the industry?  02:18PM

8  MR CANNON: Objection; vague  02:18PM

9  THE WITNESS: Yes  02:18PM

10  BY MR  WONG:  02:18PM

11  Q  And did you try to use accepted industry acronyms  02:18PM

12  when coming up with the commands listed in Exhibit 316?  02:18PM

13  MR CANNON: Objection; vague  02:18PM

14  THE WITNESS: Yes  02:18PM

15  BY MR  WONG:  02:18PM

16  Q  If you look down at the bottom of page 4,  02:18PM

17  No 10 -- let me know when you are there  02:18PM

18  A  Yeah  02:19PM

19  Q  -- it says, "Commands should tend to be  02:19PM

20  self-explanatory so that a relatively knowledgeable user  02:19PM

21  can figure out the command function from the command and  02:19PM

22  on-line help without having to scurry off to the  02:19PM

23  manuals "  02:19PM

24  Do you see that?  02:19PM

25  A  Yes  02:19PM

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1  Q  Did you consider that guideline when you were  02:19PM

2  devising the command syntaxes listed on Exhibit 316?  02:19PM

3  MR CANNON: Objection; vague  02:19PM

4  THE WITNESS: Yes  In general, yes  02:19PM

5  BY MR  WONG:  02:19PM

6  Q  How important is the vocabul- -- strike that  02:19PM

7  How important is -- is understanding the  02:19PM

8  vocabulary of the intended user of a command to coming  02:19PM

9  up with a command syntax, in your view?  02:19PM

10  MR CANNON: Objection; vague, lacks foundation,  02:19PM

11  calls for improper opinion testimony  02:19PM

12  THE WITNESS: It's fairly important  02:19PM

13  BY MR  WONG:  02:20PM

14  Q  Did you consider the vocabulary of the intended  02:20PM

15  user of the LLDP functionality when you were coming up  02:20PM

16  with the commands listed on Exhibit 316?  02:20PM

17  MR CANNON: Objection; vague  02:20PM

18  THE WITNESS: Yes  02:20PM

19  BY MR  WONG:  02:20PM

20  Q  Do you think it's important to have guidelines  02:20PM

21  for the addition of new commands to a command-line  02:20PM

22  interface?  02:20PM

23  MR CANNON: Objection; vague, incomplete  02:20PM

24  hypothetical, lacks foundation, calls for improper  02:20PM

25  opinion testimony  02:20PM

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1  THE WITNESS: Yes.  02:20PM

2  BY MR. WONG:  02:20PM

3  Q  Why do you think it's important to have  02:20PM

4  guidelines for the addition of new commands to a  02:20PM

5  command-line interface?  02:20PM

6  MR. CANNON: Same objections.  02:20PM

7  THE WITNESS: The primary reason is the inability  02:20PM

8  to reverse commands and the need for backward  02:21PM

9  compatibility at every stage of the product evolution.  02:21PM

10  And that calls for basically putting out commands in a  02:21PM

11  manner that is backward compatible and extensible.  02:21PM

12  BY MR. WONG:  02:21PM

13  Q  So, in your view, considering backwards  02:21PM

14  compatibility and extensibility are both important when  02:21PM

15  coming up with a new command; correct?  02:21PM

16  MR. CANNON: Objection; vague, mischaracterizes  02:21PM

17  testimony, lacks foundation, calls for improper opinion  02:21PM

18  testimony, incomplete hypothetical.  02:21PM

19  THE WITNESS: In the context of the CLI we are  02:21PM

20  talking about, that would be correct.  02:21PM

21  BY MR. WONG:  02:21PM

22  Q  And did you consider backwards compatibility and  02:21PM

23  extensibility when you proposed the commands listed on  02:21PM

24  Exhibit 316?  02:22PM

25  MR. CANNON: Objection; vague.  02:22PM

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| | |
|---|---|
| 1 hierarchy.                                              02:38PM | 1 come up with the syntax of "clear lldp counters"?    02:42PM |
| 2      If you want a strict hierarchy, you would have an  02:38PM | 2      MR. CANNON: Objection; vague.                 02:42PM |
| 3 intermediate node and list all the specific options, but 02:38PM | 3      THE WITNESS: Oh, just that one command?        02:42PM |
| 4 since there aren't any, I might have taken this         02:38PM | 4      MR. WONG: Mm-hmm.                              02:42PM |
| 5 position; although, it's -- it's -- it may seem a little 02:38PM | 5      THE WITNESS: I don't know, 15 minutes.        02:42PM |
| 6 bit weak for in terms of future-proofing things.       02:38PM | 6 BY MR. WONG:                                        02:42PM |
| 7      So there's a -- there's a -- there's a balance    02:39PM | 7    Q   Okay. How long did it take you, approximately, 02:42PM |
| 8 between future-proofing and -- and verbosity, and -- and 02:39PM | 8 to do the source code writing to implement the      02:42PM |
| 9 the more you try to feature-proof, the more verbose you 02:39PM | 9 functionality for the "clear lldp counters" command? 02:42PM |
| 10 can become, so it's more of a subjective column how you 02:39PM | 10      MR. CANNON: Objection; vague, assumes facts not 02:42PM |
| 11 design, keeping all of these in mind, yeah.           02:39PM | 11 in evidence.                                        02:42PM |
| 12   Q   Thank you.                                      02:39PM | 12      THE WITNESS: Okay. That would be, again,       02:42PM |
| 13      And after letter "d" on Exhibit 321, you say,    02:39PM | 13 15 minutes, and I have to add that this is a easiest one 02:42PM |
| 14 quote: It is more intuitive for first-time users, end 02:39PM | 14 to implement.                                       02:42PM |
| 15 quote.                                                02:39PM | 15 BY MR. WONG:                                        02:42PM |
| 16      Do you see that?                                 02:39PM | 16   Q   For the "clear lldp table" command --         02:42PM |
| 17   A   Yes.                                            02:39PM | 17   A   Mm-hmm.                                       02:42PM |
| 18   Q   What did you mean by that?                      02:39PM | 18   Q   -- what functionality does that perform?      02:43PM |
| 19   A   This means that -- that user interface should   02:39PM | 19   A   That is, again, a reset, but more at the enable 02:43PM |
| 20 flow naturally in a sense that if I've never used     02:39PM | 20 level in the sense that, let's say, a device comes up 02:43PM |
| 21 anything similar, I should be pretty much able to -- I 02:39PM | 21 and it discovers ten neighbors and we want to come in 02:43PM |
| 22 should be able to come in and type in a reasonable    02:39PM | 22 and manually reset the table by making it forget all 02:43PM |
| 23 keyword for things and get help on it and be able to  02:40PM | 23 those ten neighbors instantly, then we would use that 02:43PM |
| 24 complete a configuration within a reasonable amount of 02:40PM | 24 command.                                            02:43PM |
| 25 time rather than going through hours of research on it. 02:40PM | 25   Q   And approximately how long did it take you to 02:43PM |
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| | |
|---|---|
| 1   Q   And that approach that you just described, did  02:40PM | 1 come up with the syntax of "clear lldp table"?       02:43PM |
| 2 you apply that approach for the commands that are listed 02:40PM | 2      MR CANNON: Objection; vague                    02:43PM |
| 3 in Exhibit 316?                                        02:40PM | 3      THE WITNESS: The answer would be very similar to 02:43PM |
| 4      MR. CANNON: Objection; vague.                    02:40PM | 4 the other "clear" command                            02:43PM |
| 5      THE WITNESS: The -- what is 316? This is the     02:40PM | 5 BY MR WONG:                                          02:43PM |
| 6 one -- okay. This -- it -- it certainly influenced our 02:40PM | 6   Q   About 15 minutes?                              02:43PM |
| 7 structure for these commands. Yeah, so intuitiveness,  02:40PM | 7   A   Yes                                            02:43PM |
| 8 extensibility, usability, aesthetics are all factors   02:40PM | 8   Q   And did it take you also about 15 minutes to   02:43PM |
| 9 that we considered.                                    02:40PM | 9 write the underlying source code for the functionality 02:43PM |
| 10 BY MR. WONG:                                          02:41PM | 10 of the "clear lldp table" command?  '               02:43PM |
| 11   Q   Let's look at Exhibit 316 now, Mr. Patil.      02:41PM | 11   A   No                                            02:43PM |
| 12   A   Yeah.                                           02:41PM | 12   Q   How long, approximately, did it take you to come 02:43PM |
| 13   Q   Starting with the first command, you were      02:41PM | 13 up with the -- strike that                          02:43PM |
| 14 associated with "clear lldp counters."               02:41PM | 14      How long, approximately, did it take you to write 02:43PM |
| 15      Do you see that?                                 02:41PM | 15 the source code for the "clear lldp table" command?  02:43PM |
| 16   A   Yes.                                            02:41PM | 16      MR CANNON: Objection; vague                    02:44PM |
| 17   Q   What function does the "clear lldp counters"   02:41PM | 17      THE WITNESS: I can't quantify it readily, but it 02:44PM |
| 18 command perform?                                      02:41PM | 18 would be, if you tally the total time spent on it, maybe 02:44PM |
| 19   A   It's basically a reset, if you will, of all the 02:41PM | 19 a couple hours, because there is dependencies to handle 02:44PM |
| 20 statistics that have been accumulated over a period of 02:41PM | 20 It's not as easy as setting a bunch of numbers to zero 02:44PM |
| 21 time, and if you want to start off on a clean slate   02:41PM | 21 BY MR WONG:                                          02:44PM |
| 22 again at a certain period of time on a -- on a certain 02:41PM | 22   Q   And for all of the commands listed on          02:44PM |
| 23 router or switch, then you could issue that command and 02:42PM | 23 Exhibit 316, Mr Patil, can you describe for me,      02:44PM |
| 24 it will clear all the statistics.                     02:42PM | 24 generally, what type of source code you would need to 02:44PM |
| 25   Q   And how long did it take you, approximately, to 02:42PM | 25 write to implement the functionality?               02:44PM |
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| | |
|---|---|
| 1    MR. CANNON: Objection; compound, vague, lacks   02:44PM | 1    MR. CANNON: And because of that, we are going to   02:47PM |
| 2  foundation, incomplete hypothetical, calls for improper   02:44PM | 2  have a standing objection to questions about this   02:47PM |
| 3  opinion testimony   02:44PM | 3  partial document without the sufficient context for it   02:47PM |
| 4    THE WITNESS: So to clarify the question, what   02:44PM | 4  to be reviewed or understood   02:47PM |
| 5  type of code needs to be written to clear the command   02:44PM | 5  BY MR. WONG:   02:47PM |
| 6  for the "clear" commands?   02:44PM | 6    Q  Now, Mr. Patil, I'm just providing this exhibit   02:47PM |
| 7    MR. WONG: No, no   02:44PM | 7  for you so that you can refresh your recollection, if   02:48PM |
| 8    Q  So, for example, you know, to write the source   02:44PM | 8  you need to --   02:48PM |
| 9  code for any of these commands listed on Exhibit 316 --   02:44PM | 9    A  Mm-hmm   02:48PM |
| 10    A  Yeah   02:44PM | 10    Q  -- about what these various commands do  I won't   02:48PM |
| 11    Q  -- what are the types of source code that would   02:44PM | 11  ask you any other questions about this exhibit, but feel   02:48PM |
| 12  need to be written in order to implement them?   02:45PM | 12  free to refer to Exhibit 322 --   02:48PM |
| 13    MR. CANNON: Objection; compound, vague, lacks   02:45PM | 13    A  Yeah   02:48PM |
| 14  foundation, incomplete hypothetical, calls for improper   02:45PM | 14    Q  -- to answer my questions   02:48PM |
| 15  opinion testimony   02:45PM | 15    A  Yes   02:48PM |
| 16    THE WITNESS: The source code is written in C --   02:45PM | 16    Q  So my question that I posed a few minutes ago is:   02:48PM |
| 17  C language, and, essentially, all these commands have a   02:45PM | 17  What is the function performed by the "lldp holdtime"   02:48PM |
| 18  callback which can be implemented as a C function, and   02:45PM | 18  command?   02:48PM |
| 19  whenever a user travels to a certain point and they pass   02:45PM | 19    MR. CANNON: Objection --   02:48PM |
| 20  tree, that function that gets attached to that node in   02:45PM | 20    THE WITNESS: So   02:48PM |
| 21  the tree gets executed, and, basically, it's -- it's   02:45PM | 21    MR. CANNON: -- lacks foundation, document speaks   02:48PM |
| 22  given the information about the construct that it's   02:45PM | 22  for itself   02:48PM |
| 23  handling, and, at that point, they -- they just -- we   02:45PM | 23    THE WITNESS: -- after reading, I still cannot   02:48PM |
| 24  just go in and change the fields in there   02:45PM | 24  completely understand why we did that or what the   02:48PM |
| 25  BY MR. WONG:   02:45PM | 25  concept is, because it's been a while since I wrote this   02:48PM |
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| 1    Q  And that explanation you just provided applies to   02:45PM | 1  and I've not used it for a long time   02:48PM |
| 2  all of the commands listed here on Exhibit 316; correct?   02:45PM | 2    But I think it's a request from the sender to the   02:49PM |
| 3    A  Yes.   02:45PM | 3  receiver to hold neighbor information, at least for a   02:49PM |
| 4    MR. CANNON: Objection; vague, compound.   02:45PM | 4  certain period of time, regardless of whether they get   02:49PM |
| 5  BY MR. WONG:   02:45PM | 5  utilized  That's my understanding   02:49PM |
| 6    Q  What is the functionality performed by the "lldp   02:46PM | 6  BY MR. WONG:   02:49PM |
| 7  holdtime" command?   02:46PM | 7    Q  And how long, approximately, did it take you to   02:49PM |
| 8    A  Yeah, so that's an interesting one. It's a   02:46PM | 8  come up with the syntax for the "lldp holdtime" command?   02:49PM |
| 9  subtle one, and I -- being that it's ten years since I   02:46PM | 9    MR. CANNON: Objection; vague   02:49PM |
| 10  wrote this, I've forgotten that, but it's -- it's kind   02:46PM | 10    THE WITNESS: The actual -- the command itself?   02:49PM |
| 11  of technical detail on LLDP that I can look up if you   02:46PM | 11    MR. WONG: The actual -- yes, the syntax of the   02:49PM |
| 12  want, but --   02:46PM | 12  command   02:49PM |
| 13    MR. WONG: Maybe this will help you.   02:46PM | 13    MR. CANNON: Objection; vague   02:49PM |
| 14    What's the next exhibit number?   02:46PM | 14    THE WITNESS: 15 minutes   02:49PM |
| 15    THE REPORTER: 322.   02:47PM | 15  BY MR. WONG:   02:49PM |
| 16    (Exhibit 322 was marked for   02:47PM | 16    Q  Is your answer 15 minutes for all of the commands   02:49PM |
| 17    identification by the Court Reporter.)   02:47PM | 17  listed in Exhibit 316?   02:49PM |
| 18    MR. WONG: The Court Reporter has marked, as   02:47PM | 18    A  No   02:49PM |
| 19  Exhibit 322, a document bearing Bates number, on the   02:47PM | 19    MR. CANNON: Objection; compound and vague   02:49PM |
| 20  front page, CSI-CLI-00291752, and the last page of this   02:47PM | 20    MR. WONG: I'm just trying to save time here,   02:49PM |
| 21  document is CSI-CLI-00292238, and for clarity on the   02:47PM | 21  Mr. Patil   02:49PM |
| 22  record, this is not the complete document. The complete   02:47PM | 22    Q  Okay  What is the function performed by the   02:49PM |
| 23  document is over 500 pages long. This is excerpted   02:47PM | 23  "lldp receive" command?   02:49PM |
| 24  pages from this document produced by Cisco with just the   02:47PM | 24    A  Basically, we announce that we are open on the   02:49PM |
| 25  LLDP-related commands.   02:47PM | 25  receive channel for that interface   02:50PM |
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1    Q   And how long did it take for you to come up with   02:50PM
2  the syntax for that command?                           02:50PM
3       MR. CANNON: Objection; vague.                     02:50PM
4       THE WITNESS: Several hours because that's where  02:50PM
5  we went back and forth on the extensibility, usability, 02:50PM
6  redundancy, verbosity, and those discussions.          02:50PM
7  BY MR. WONG:                                           02:50PM
8    Q   What is the function performed by the "lldp      02:50PM
9  reinit" command?                                       02:50PM
10   A   It specifies the amount of wait time for the     02:50PM
11 protocol to reinitialize at any point in time.         02:50PM
12   Q   And how long did it take for you to come up with 02:50PM
13 the command syntax for the "lldp reinit" command?      02:50PM
14      MR. CANNON: Objection; vague.                     02:50PM
15      THE WITNESS: That's -- that one is in the         02:50PM
16 15-minute category.                                    02:50PM
17 BY MR. WONG:                                           02:50PM
18   Q   Did it also take you approximately 15 minutes to 02:51PM
19 come up with the "lldp run" command? And I'm referring 02:51PM
20 to the command syntax.                                 02:51PM
21      MR. CANNON: Objection; vague.                     02:51PM
22      THE WITNESS: "Lldp run," yes.                     02:51PM
23 BY MR. WONG:                                           02:51PM
24   Q   Did it also take you 15 minutes to come up with  02:51PM
25 the syntax for "lldp timer"?                           02:51PM

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1  than 15 minutes for you to come up with the command    02:52PM
2  syntax, setting aside the "lldp transmit" and "lldp     02:52PM
3  receive" commands.                                      02:52PM
4    A   Right.                                            02:52PM
5       "Tlv-select." Some of the org-specific ones        02:52PM
6  are -- they are just basically the -- they -- they are   02:53PM
7  straight up describing what they are, so that shouldn't  02:53PM
8  have been long.                                         02:53PM
9       I would say "tlv-select," "transmit" and           02:53PM
10 "receive," and maybe even "rate" command. Significant   02:53PM
11 thought process involved in -- in coming up with the     02:53PM
12 right keywords.                                         02:53PM
13   Q   I'm sorry, did you say "rate command"?             02:53PM
14   A   Yeah, "lldp rate."                                02:53PM
15   Q   Oh, okay. So I'm looking at Exhibit 316, and I     02:53PM
16 do not believe the "rate" command --                    02:53PM
17   A   Oh, oh, I see --                                  02:53PM
18   Q   -- is -- is part of that.                          02:53PM
19   A   -- is part of that. Okay. I was looking at 322.   02:53PM
20      So among 316, I would say --                        02:53PM
21   Q   Let me just ask the fresh question so that it's    02:53PM
22 clear --                                                02:53PM
23   A   Yes.                                              02:53PM
24   Q   -- on the record.                                 02:53PM
25   A   Yes.                                              02:53PM

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1       MR. CANNON: Objection; vague               02:51PM
2       THE WITNESS: I don't know that one because I -- 02:51PM
3  I recall that some of these had a lot of discussion    02:51PM
4  involved, and I -- I can clearly say that transmit and  02:51PM
5  receive fell into that category                        02:51PM
6  BY MR. WONG:                                          02:51PM
7    Q   Of taking longer than 15 minutes?              02:51PM
8    A   Longer time, longer than 15 minutes            02:51PM
9    Q   For the other commands listed on Exhibit 316 that 02:51PM
10 are not the "lldp transmit" and "lldp receive"         02:51PM
11 commands --                                           02:51PM
12   A   Mm-hmm                                         02:51PM
13   Q   -- do you believe that you spent approximately  02:52PM
14 15 minutes coming up with the command syntax for each of 02:52PM
15 those?                                                02:52PM
16      MR. CANNON: Objection; vague and compound     02:52PM
17      THE WITNESS: I would say a good 50 percent of   02:52PM
18 those, but some of the commands I struggle with myself  02:52PM
19 to -- to put out the best initial proposal, so not     02:52PM
20 everything is 15 minutes Some of them took where I     02:52PM
21 went back and looked at other things and see what's the 02:52PM
22 most usable token to put there and a keyword to put    02:52PM
23 there                                                 02:52PM
24 BY MR. WONG:                                          02:52PM
25   Q   Which of the commands do you think took longer  02:52PM

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1    Q   So for the commands listed on Exhibit 316 --     02:53PM
2    A   Yeah                                            02:53PM
3    Q   -- which of the commands do you believe you spent 02:54PM
4  more than 15 minutes on coming up with the command     02:54PM
5  syntax?                                                02:54PM
6    A   "Transmit" and "receive," the "show" commands,   02:54PM
7  "tlv-select" command, "lldp timer" command, and "lldp  02:54PM
8  reinit" command                                       02:54PM
9    Q   Approximately how long do you think it took you  02:54PM
10 to come up with the command syntax for the "lldp reinit" 02:54PM
11 command?                                               02:54PM
12      MR. CANNON: Objection; vague                    02:54PM
13      THE WITNESS: I struggled with it  I'm not       02:54PM
14 particularly happy with the way it is right -- right   02:54PM
15 here  Reading it is kind of a, for lack of a better     02:54PM
16 term, awkward keyword, but I didn't have anything better 02:55PM
17 to say -- to use there, so I might have struggled with  02:55PM
18 it for 45 minutes                                      02:55PM
19 BY MR. WONG:                                          02:55PM
20   Q   But do you have an actual memory of spending     02:55PM
21 45 minutes on this command?                           02:55PM
22   A   Yes                                             02:55PM
23   Q   Okay                                           02:55PM
24   A   I mean, I had something else before, and I took  02:55PM
25 it out and rewired the code and etc , yeah            02:55PM

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| | |
|---|---|
| 1  Q  When -- 03:42PM | 1  to both of you 03:44PM |
| 2  A  Actually, I'm sorry, I take that back. I do have 03:42PM | 2  MR WONG: Thank you 03:44PM |
| 3  a legal certificate -- I used to have a legal 03:42PM | 3  THE VIDEOGRAPHER: We are off the record at 03:44PM |
| 4  certification. 03:42PM | 4  3:45 p m This concludes today's testimony given by 03:44PM |
| 5  Q  What kind of legal certi- -- certification did 03:42PM | 5  Devadas Patil  The total number of media used was four 03:44PM |
| 6  you have? 03:42PM | 6  and will be retained by Veritext LLC 03:44PM |
| 7  A  I had a Series 63 at one point. 03:42PM | 7  (TIME NOTED: 3:44 P M ) |
| 8  Q  Do you have any training in intellectual property 03:42PM | 8 |
| 9  law? 03:42PM | 9 |
| 10  A  No. 03:42PM | 10 |
| 11  Q  Did you analyze intellectual property issues when 03:42PM | 11 |
| 12  you were writing your master's thesis at MIT? 03:42PM | 12 |
| 13  A  No. 03:42PM | 13 |
| 14  Q  Have you reviewed any of Cisco's patents related 03:42PM | 14 |
| 15  to SysDB? 03:42PM | 15 |
| 16  A  Related to SysDB, I might have glossed over a 03:42PM | 16 |
| 17  couple of them, but I've not reviewed them in detail. 03:42PM | 17 |
| 18  Q  Are you aware that the administrative law judge 03:42PM | 18 |
| 19  in an International Trade Commission investigation has 03:42PM | 19 |
| 20  found that Arista's EOS software infringes Cisco patents 03:42PM | 20 |
| 21  related to SysDB? 03:42PM | 21 |
| 22  MR. WONG: Object to the form of the question. 03:43PM | 22 |
| 23  THE WITNESS: I'm now aware of it, but not before 03:43PM | 23 |
| 24  a few days ago. 03:43PM | 24 |
| 25  BY MR. CANNON: 03:43PM | 25 |
| Page 230 | Page 232 |

| | |
|---|---|
| 1  Q  So you were not aware of that when you wrote your 03:43PM | 1  I declare under penalty of perjury |
| 2  master's thesis? 03:43PM | 2  under the laws that the foregoing is |
| 3  A  No. 03:43PM | 3  true and correct. |
| 4  Q  Last bit. 03:43PM | 4 |
| 5  Earlier, do you remember talking about how you 03:43PM | 5  Executed on _____ , 20___ , |
| 6  weren't particularly happy sitting here today with the 03:43PM | 6  at _____ , _____ . |
| 7  "lldp reinit" command? 03:43PM | 7 |
| 8  A  Yes. 03:43PM | 8 |
| 9  Q  Why aren't you happy about that, sitting here 03:43PM | 9 |
| 10  today? 03:43PM | 10 |
| 11  A  It's not about just today. I was not happy to 03:43PM | 11 |
| 12  begin with it -- to begin with, because I struggled with 03:43PM | 12  _____ |
| 13  it a lot, and I couldn't come up with a nice term to 03:43PM | 13  DEVADAS PATIL |
| 14  mean reinit, reinitialize, and, yeah, that was the 03:43PM | 14 |
| 15  source of my dissatisfaction with it. 03:43PM | 15 |
| 16  Q  Do you recall alternatives to "reinit" that you 03:43PM | 16 |
| 17  considered at the time? 03:43PM | 17 |
| 18  A  I -- like I said, I spent 45 minutes on it, and 03:44PM | 18 |
| 19  that's the best I could come up with, and given the time 03:44PM | 19 |
| 20  pressure, I had to propose it and move with it. 03:44PM | 20 |
| 21  MR. CANNON: Nothing further for me right now. 03:44PM | 21 |
| 22  MR. WONG: We're done. 03:44PM | 22 |
| 23  THE WITNESS: Great. 03:44PM | 23 |
| 24  MR. CANNON: Thank you very much. 03:44PM | 24 |
| 25  THE WITNESS: Not a problem. I hope it is useful 03:44PM | 25 |
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CONFIDENTIAL

1     I, the undersigned, a Certified Shorthand

2  Reporter of the State of California, do hereby certify:

3     That the foregoing proceedings were taken before

4  me at the time and place herein set forth; that any

5  witnesses in the foregoing proceedings, prior to

6  testifying, were placed under oath; that a verbatim

7  record of the proceedings was made by me using machine

8  shorthand which was thereafter transcribed under my

9  direction; further, that the foregoing is an accurate

10  transcription thereof.

11     I further certify that I am neither financially

12  interested in the action nor a relative or employee of

13  any attorney or any of the parties.

14     IN WITNESS WHEREOF, I have this date subscribed

15  my name.

16     Dated: March 2, 2016

17

18

19

20

21    RACHEL FERRIER

22    CSR No. 6948

23

24

25

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Veritext Legal Solutions
866 299-5127

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HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

1              UNITED STATES DISTRICT COURT

2            NORTHERN DISTRICT OF CALIFORNIA

3                 SAN JOSE DIVISION

4

   CISCO SYSTEMS, INC.        Case No.: 5:14-cv-05344-BLF(PSG)

5

              Plaintiff,

6

       v.

7

   ARISTA NETWORKS, INC.

8

              Defendants.

9      _____

10

11

12

13     * HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY *

14

15      VIDEOTAPED DEPOSITION OF PHILLIP REMAKER

16         30(b)(6) FOR CISCO SYSTEMS, INC.

17             Palo Alto, California

18          Thursday, March 31, 2016

19                 Volume 1

20

21     Reported by:

22     LESLIE JOHNSON

23     RPR, CSR No. 11451

24     Job No.: 2281749

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```
 1          UNITED STATES DISTRICT COURT
 2     FOR THE NORTHERN DISTRICT OF CALIFORNIA
 3            SAN JOSE DIVISION
 4
       CISCO SYSTEMS, INC      Case No : 5:14-cv-05344-BLF(PSG)
 5
              Plaintiff,
 6
 7     v
 8     ARISTA NETWORKS, INC
              Defendants
 9
10
11
12
13
14     * HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY *
15
16
17     VIDEOTAPED DEPOSITION OF PHILLIP REMAKER, Volume 1,
18  taken on behalf of Defendant, at 601 California Avenue,
19  Palo Alto, California, beginning at 9:30 a m  and ending
20  at 4:14 p m , on Thursday, March 31, 2016, before
21  LESLIE JOHNSON, Certified Shorthand Reporter No  11451
22
23
24
25
                                          Page  2
```

```
 1     APPEARANCES:
 2
 3     FOR PLAINTIFF CISCO SYSTEMS, INC.:
 4        QUINN EMANUEL URQUHART & SULLIVAN LLP
 5        BY: JOHN (JAY) NEUKOM, ESQ.
 6        50 California Street, 22nd Floor
 7        San Francisco, California  94111
 8        (415)875-6600
 9        johnneukom@quinnemanuel.com
10     FOR DEFENDANT ARISTA NETWORKS, INC.:
11        KEKER & VAN NEST LLP
12        BY: RYAN WONG, ESQ.
13        633 Battery Street
14        San Francisco, California  94111
15        (415)391-5400
16        rwong@kvn.com
17     ALSO PRESENT:
18        SEAN GRANT, Videographer
19
20
21
22
23
24
25
                                          Page  3
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| 1 | EXHIBITS (Cont.) |
|---|---|
| 2 | PHILLIP REMAKER, 30(b)(6) |
| 3 | NUMBER          DESCRIPTION          PAGE |
| 4 | Exhibit 447  Plaintiff Cisco Systems, Inc.'s Seventh  164 |
|   | Supplemental Objections and Responses |
| 5 | to Defendant Arista Network, Inc.'s |
|   | Second Set of Interrogatories |
| 6 | (No. 16); 50 pages |
| 7 | Exhibit 448  Plaintiff Cisco System, Inc.'s Fourth  167 |
|   | Supplemental Objections and Responses |
| 8 | to Defendant Arista Network, Inc's |
|   | First Set of Interrogatories (2 and 5); |
| 9 | 44 pages |
| 10 | Exhibit 449  Cisco's Response to Arista's          182 |
|   | Interrogatory No. 16 Amended Exhibit |
| 11 | D1 (IOS Release 11.0); 28 pages |
| 12 | Exhibit 450  Exhibit E Exemplary Copying of Command  201 |
|   | Responses; 27 pages |
| 13 | |
|   | Exhibit 451  Writing Command Line Interfaces (CLI)  204 |
| 14 | and CLI Output; Bates stamped |
|   | CSI-CLI-02607986 to 8010 |
| 15 | |
|   | * * * |
| 16 | |
| 17 | |
| 18 | |
| 19 | |
| 20 | |
| 21 | |
| 22 | |
| 23 | |
| 24 | |
| 25 | |

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1    plaintiff.
2        THE VIDEOGRAPHER:  Thank you.  Will the
3    certified court reporter please swear in the
4    witness.
5
6            PHILLIP REMAKER,
7    having been first duly sworn, was examined
8    and testified as follows:
9
10            EXAMINATION
11   BY MR. WONG:
12       Q.  Good morning, Mr. Remaker.
13       A.  Good morning.
14       Q.  Do you understand that you are testifying
15   under oath?
16       A.  I understand.
17       Q.  Okay.  And I know we took your personal
18   deposition yesterday.  Do you understand that the
19   general rules for conducting a deposition are also
20   applicable today?
21       A.  Yes.
22       Q.  Do you understand that you have been
23   designated by Plaintiff Cisco to provide corporate
24   testimony under Rule 30(b)(6) today?
25       A.  Yes.

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1        Palo Alto, California, Thursday, March 31, 2016
2            9:30 a.m.
3
4        THE VIDEOGRAPHER:  Good morning.  We're on
5    the record.  The time is 9:30 a.m. and the date is
6    March 31st, 2016.  This begins the videotaped
7    deposition of Cisco Systems, Inc. pursuant to Rule
8    30(b)(6).  My name is Sean Grant, here with our
9    court reporter, Leslie Johnson.  We're here from
10   Veritext Legal Solutions at the request of counsel
11   for Defendant.  This deposition is being held at
12   Wilson Sonsini in Palo Alto, California.
13       The caption of this case is Cisco Systems
14   Inc. versus Arista Networks, Inc., Case No.
15   5:14-cv-05344-BLF.
16       Please note that audio and video recording
17   will take place unless all parties have agreed to go
18   off the record.  Microphones are sensitive and may
19   pick up whispers, private conversations or cellular
20   interference.
21       At this time, will counsel please identify
22   themselves and state whom they represent.
23       MR. WONG:  Ryan Wong from Keker & Van Nest
24   for Defendant Arista Networks.
25       MR. NEUKOM:  John Neukom for the

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1        (Exhibit 429 marked for identification.)
2        MR. WONG:  Let's mark this as the first
3    deposition exhibit.  I believe we are on 429.
4        THE REPORTER:  Correct.
5    BY MR. WONG:
6        Q.  The court reporter has marked Exhibit 429,
7    a document that on its face says "Defendant Arista
8    Network, Inc.'s Notice of Rule 30(b)(6) Deposition
9    of Plaintiff Cisco Systems, Inc."
10       Mr. Remaker, do you recognize the document
11   marked as Exhibit 429?
12       MR. NEUKOM:  It might help you to turn to
13   page 23.
14       MR. WONG:  Thank you, Counsel.
15       MR. NEUKOM:  Start with paragraph 78.
16       THE WITNESS:  Yes, I recognize this
17   document.
18   BY MR. WONG:
19       Q.  Do you understand that you have been
20   designated by Cisco to provide corporate testimony
21   for topic No. 78 that appears on page 23 of
22   Exhibit 429?
23       A.  Yes.
24       Q.  Do you understand that you've been
25   designated by Cisco to provide corporate testimony

Page 9

Pages 6 to 9

| | |
|---|---|
| 1 answered. | 1 group, the Parser Police mailing list, and any other |
| 2     THE WITNESS: Cisco trusts the engineers | 2 related mailing lists run by individual |
| 3 that they hired that are experts in the topic. | 3 organizations. |
| 4 BY MR. WONG: | 4     Q. Anything else? |
| 5     Q. Mr. Remaker, did you review any deposition | 5     A. Nothing I can think of off the top of my |
| 6 testimony provided in this case to prepare for this | 6 head. |
| 7 corporate deposition? | 7     Q. Is customer feedback a potential resource |
| 8     A. Yes. | 8 for an employee who is creating a new CLI command? |
| 9     Q. Did you review the deposition transcript | 9     MR. NEUKOM: Objection. The question |
| 10 of Mr. Patel? | 10 phrased in a hypothetical. |
| 11     A. I did not. | 11     THE WITNESS: Customer feedback may be |
| 12     Q. In the process of adding a new CLI command | 12 used in the creation of a new CLI command. |
| 13 to a Cisco operating system, is there a preferred or | 13 BY MR. WONG: |
| 14 best practice development approach that are followed | 14     Q. Are industry standards resources that may |
| 15 by Cisco engineers? | 15 be used by Cisco employees to create CLI commands? |
| 16     MR. NEUKOM: Objection. Asked and | 16     MR. NEUKOM: Objection. Vague. Calls for |
| 17 answered. Also vague and compound. | 17 a legal solution. |
| 18     THE WITNESS: Is there a best practice | 18     THE WITNESS: Development engineers may |
| 19 for? | 19 use standards in the preparation of CLI commands. |
| 20 BY MR. WONG: | 20 BY MR. WONG: |
| 21     Q. The development of and creation of a new | 21     Q. And that includes IEEE standards, correct. |
| 22 CLI command to be added to the operating system? | 22     MR. NEUKOM: Objection. Vague and |
| 23 And let me just give you some context. | 23 compound. |
| 24     Mr. Patel testified about a five-stage | 24     THE WITNESS: That is my understanding. |
| 25 development process for adding new features to the | 25 //// |
| Page 154 | Page 156 |

| | |
|---|---|
| 1 Cisco's CLI and described how proposing the new CLI | 1 BY MR. WONG: |
| 2 commands for those features, what stages those were | 2     Q. That could also include IETF standards, |
| 3 done in. | 3 correct? |
| 4     A. Okay. | 4     A. That is my understanding. |
| 5     Q. And he testified that he thought this was | 5     Q. And is the existing command set in the |
| 6 called the waterfall approach. I wasn't familiar | 6 Cisco CLI another resource that an engineer may |
| 7 with that, but he described it as a five-stage | 7 consult when coming up with a new CLI command? |
| 8 approach to development. | 8     MR. NEUKOM: Objection. Vague and |
| 9     So my question to you is: Is there a | 9 compound. |
| 10 preferred approach at Cisco to come up with new CLI | 10     THE WITNESS: Are you saying can they look |
| 11 commands in the process of adding new functionality | 11 at the existing code to develop new code? |
| 12 to Cisco's devices? | 12 BY MR. WONG: |
| 13     A. The best practices may vary by individual | 13     Q. Uh-huh. |
| 14 development group. | 14     A. Yes. |
| 15     Q. So you would have to look at each | 15     Q. Are there any resources that a Cisco |
| 16 development group to see whether there is a best | 16 engineer is not allowed to consult when coming up |
| 17 practice to coming up with a new CLI command; is | 17 with a new command syntax? |
| 18 that right? | 18     A. Beyond what they're not allowed to consult |
| 19     A. I would have to look at each individual | 19 with in general, based on the terms of employment, |
| 20 development group. | 20 I'm not aware of any specific restrictions. |
| 21     Q. What resources are available for an | 21     Q. Are Cisco employees free to rely upon |
| 22 engineer to consult when coming up with a new CLI | 22 their own experiences working with non-Cisco CLI's |
| 23 command? | 23 when coming up with new CLI commands for Cisco IOS? |
| 24     A. The resources include specific documents | 24     MR. NEUKOM: Objection. Vague. |
| 25 in the development process for each individual | 25 Hypothetical. |
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Pages 154 to 157

HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

1  estimate for us the number of documents -- the
2  number of historical Cisco documents you reviewed to
3  prepare yourself to testify today as a corporate
4  representative?
5      A.  Easily 60 to 100 documents.
6      Q.  And can you describe by category what
7  sorts of documents you reviewed to prepare yourself
8  to come testify today about the historical
9  origination of Cisco command line expressions?
10     A.  Individual command specifications written
11  by engineers, source code, some e-mails, some
12  internal web pages, and the deposition of Kirk
13  Lougheed.
14     Q.  Do you believe there is anybody within
15  Cisco who knows more about the historical creation
16  of the 500-plus command line expressions identified
17  in Exhibit 431, other than you?
18     A.  No.
19         MR. NEUKOM:  Thanks very much.
20         MR. WONG:  Thank you.
21         THE VIDEOGRAPHER:  This concludes today's
22  videotaped deposition of Cisco Systems, Inc.
23  pursuant to Rule 30(b)(6).
24         We're off the record at 4:14 p m.
25         (TIME NOTED:  4:14 p m.)

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1          REPORTER'S CERTIFICATION
2
3      I, Leslie Johnson, a Certified Shorthand
4  Reporter of the State of California, do hereby certify:
5      That the foregoing proceedings were taken
6  before me at the time and place herein set forth; that
7  any witnesses in the foregoing proceedings, prior to
8  testifying, were administered an oath; that a record of
9  the proceedings was made by me using machine shorthand
10  which was thereafter transcribed under my direction;
11  that the foregoing transcript is a true record of the
12  testimony given.
13      Further, that if the foregoing pertains to
13  the original transcript of a deposition in a Federal
14  Case, before completion of the proceedings, review
15  of the transcript [ ] was [ ] was not requested.
16  I further certify I am neither financially interested in
17  the action nor a relative or employee of any attorney or
18  any party to this action.
19      IN WITNESS WHEREOF, I have this date
    subscribed my name.
20  Dated: April 15, 2016
21
22
23      <%signature%>
24      LESLIE JOHNSON
25      CSR No. 11451, RPR, CCRR

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1          DECLARATION UNDER PENALTY OF PERJURY
2
3      I, PHILLIP REMAKER, the witness herein,
4  declare under penalty of perjury that I have read the
5  foregoing in its entirety; and that the testimony
6  contained therein, as corrected by me, is a true and
7  accurate transcription of my testimony elicited at said
8  time and place.
9
10     Executed this _____ day of _____ 2016, at
11  _____, _____.
12     (City)          (State)
13
14
15
16
17     _____
18          PHILLIP REMAKER
19
20
21
22
23
24
25

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Pages 214 to 216

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1          UNITED STATES DISTRICT COURT

2        NORTHERN DISTRICT OF CALIFORNIA

3            SAN JOSE DIVISION

4

5     _____

                              )

6    CISCO SYSTEMS, INC.,       )

7            Plaintiff,         )

8        vs.                    ) Case No.:

                              ) 5:14-cv-05344-BLF(PSG)

9    ARISTA NETWORKS, INC.,     )

                              )

10        Defendant.            )

     _____ )

11

12

13    ATTORNEYS' EYES ONLY - HIGHLY CONFIDENTIAL

14      VIDEOTAPED DEPOSITION OF ABHAY ROY

15          Palo Alto, California

16      Friday, December 18, 2015

17            Volume 1

18

19

20

21   Reported by:

22   RACHEL FERRIER

23   CSR No. 6948

24   Job No. 2200521

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HIGHLY CONFIDENTIAL- ATTORNEYS' EYES ONLY

| | |
|---|---|
| 1      UNITED STATES DISTRICT COURT<br>2      NORTHERN DISTRICT OF CALIFORNIA<br>3      SAN JOSE DIVISION<br>4<br>5  _____<br>             )<br>6  CISCO SYSTEMS, INC.,    )<br>             )<br>7      Plaintiff,   )<br>             )<br>8   vs.      )Case No.:<br>          )5:14-cv-05344-BLF(PSG)<br>9  ARISTA NETWORKS, INC.,  )<br>            )<br>10      Defendant.   )<br>   _____)<br>11<br>12<br>13      VIDEOTAPED DEPOSITION OF ABHAY ROY, VOLUME 1,<br>14 taken on behalf of the Defendant, at Wilson Sonsini<br>15 Goodrich & Rosati, 601 California Avenue, Palo Alto,<br>16 California, beginning at 9:30 a.m. and ending at<br>17 4:47 p.m. on Friday, December 18, 2015, before<br>18 RACHEL FERRIER, Certified Shorthand Reporter No. 6948.<br>19<br>20<br>21<br>22<br>23<br>24<br>25<br>                       Page 2 | 1 APPEARANCES (continued):<br>2<br>3 For Defendant ARISTA NETWORKS, INC.:<br>4      KEKER & VAN NEST, LLP<br>5      BY: DAVID J. SILBERT<br>6      ELIZABETH K. McCLOSKEY<br>7      Attorneys at Law<br>8      633 Battery Street<br>9      San Francisco, CA 94111<br>10      415.676.2269<br>11      dsilbert@kvn.com<br>12      emccloskey@kvn.com<br>13<br>14 Videographer:<br>15      CASSIA LEET<br>16<br>17<br>18<br>19<br>20<br>21<br>22<br>23<br>24<br>25<br>                       Page 4 |
| 1 APPEARANCES:<br>2<br>3 For Plaintiff CISCO SYSTEMS, INC., and the Witness:<br>4      QUINN EMANUEL URQUHART & SULLIVAN LLP<br>5      BY: JOHN M. NEUKOM<br>6      Attorney at Law<br>7      50 California Street, 22nd Floor<br>8      San Francisco, CA  94111<br>9      415.875.6320<br>10      johnneukom@quinnemanuel.com<br>11 and<br>12      QUINN EMANUEL URQUHART & SULLIVAN LLP<br>13      BY: SIDNEY ARCHIBALD<br>14      Attorney at Law<br>15      555 Twin Dolphin Drive, 5th Floor<br>16      Redwood Shores, CA 94065<br>17      650.801.5000<br>18      sydneyarchibald@quinnemanuel.com<br>19<br>20<br>21<br>22<br>23<br>24<br>25<br>                       Page 3 | 1                INDEX<br>2 WITNESS                EXAMINATION<br>3 ABHAY ROY<br>4 VOLUME 1<br>5<br>6          BY MR SILBERT    10, 87, 219<br>7<br>8<br>9            EXHIBITS<br>10 NUMBER        DESCRIPTION          PAGE<br>11 Exhibit 51  LinkedIn Profile for<br>      Abhay Roy                11<br>12<br>    Exhibit 52  Cisco IOS Master Command<br>13      List, All Releases        18<br>14 Exhibit 53  CLI Design and Review<br>      Guide<br>15      (Bates CSI-ANI-00073381 -<br>      00073381 000014)          40<br>16<br>    Exhibit 54  Cisco's Third Supplemental<br>17      Response to Interrogatory<br>      No  16 and Response to<br>18      Interrogatory No  19<br>      Amended Exhibit F          57<br>19<br>    Exhibit 55  Bidirectional Forwarding<br>20      Detection (BFD) for IPv4<br>      and IPv6 (Single Hop)<br>21      (Bates ARISTANDCA00030805 -<br>      00030811)                61<br>22<br>    Exhibit 56  The OSPF Specification<br>23      (Bates ARISTANDCA00022597 -<br>      00022703)                80<br>24<br>25<br>                       Page 5 |

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1  Palo Alto, California; Friday, December 18, 2015

2         9:30 a.m.

3                     09:30AM

4     THE VIDEOGRAPHER: Good morning. We are on the   09:30AM

5  record at 9:30 a.m. on December 18th, 2015.          09:30AM

6     This is the video-recorded deposition of          09:30AM

7  Abhay Roy.                          09:30AM

8     My name is Cassia Leet, here with our Court      09:30AM

9  Reporter, Rachel Ferrier. We are here from Veritext    09:30AM

10  Legal Solutions at the request of counsel for the      09:30AM

11  defendant.                          09:30AM

12     This deposition is being held at 601 California   09:30AM

13  Avenue, Palo Alto, California 94304               09:30AM

14     The caption of this case is Cisco Systems, Inc.,  09:31AM

15  versus Arista Networks, Inc., in the United States    09:31AM

16  District Court, Northern District of California,        09:31AM

17  San Jose Division, Case No. 5:14-cv-05344-BLF (PSG)   09:31AM

18     Please note that the audio and video recording   09:31AM

19  will take place unless all parties agree to go off the   09:31AM

20  record. Microphones are sensitive and may pick up     09:31AM

21  whispers and private conversations.                09:31AM

22     I am not related to any party in this action, nor  09:31AM

23  am I financially interested in the outcome in any way   09:31AM

24     If there are any objections to the proceeding,     09:31AM

25  please state them at the time of your appearance,      09:31AM

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1   Q   And -- do you know the general dates?         11:11AM
2   A   Yeah, I mean, I'll be completely widely       11:11AM
3   speculating, so I would rather not               11:12AM
4   Q   Okay  Do you have any knowledge of when Mr Ward  11:12AM
5   worked at Cisco?                                 11:12AM
6   A   Same thing                                   11:12AM
7   Q   Okay  At the time Exhibit 55 was published,   11:12AM
8   they -- both Mr Katz and Mr Ward worked at Juniper  11:12AM
9   Networks; is that right?                         11:12AM
10  A   Yes  That's what this -- that's what this     11:12AM
11  document is telling us --                        11:12AM
12  Q   Okay                                         11:12AM
13  A   -- that is rendered, yes                     11:12AM
14  Q   And Juniper Networks is a competitor of Cisco;  11:12AM
15  correct?                                         11:12AM
16  A   Yes  Juniper makes routers and switches      11:12AM
17  Q   Okay  If you look at the title of the document,  11:12AM
18  it says "Bidirectional Forwarding Detection (BFD)"  11:12AM
19      Do you see that?                             11:13AM
20  A   Yes, I see that                              11:13AM
21  Q   Is the acronym BFD one that's commonly used in   11:13AM
22  the industry?                                    11:13AM
23      MR NEUKOM: Objection; foundation, calls for    11:13AM
24  opinion testimony                               11:13AM
25      THE WITNESS: So if you stay in the scope of this  11:13AM

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1   document, the primary purpose, as I was answering    11:13AM
2   earlier, is for the reader to understand this document  11:13AM
3   and refer to -- to BFD as -- as a acronym versus saying  11:13AM
4   or fully spelling out Bidirectional Forwarding       11:13AM
5   Detection.  That's the purpose in this document.     11:13AM
6       Now, as far as the industry is concerned, I have  11:13AM
7   no idea what people want to call it, but the correct   11:13AM
8   thing to call it would be the full name, which is the  11:13AM
9   technology, which is Bidirectional Forwarding Detection.  11:13AM
10  People could abbreviate and say all sorts of things,   11:13AM
11  detection using bidirectional checks or doing all sorts  11:13AM
12  of things, so variety of options possible.           11:14AM
13      MR. SILBERT:  Okay.  But fair enough.            11:14AM
14  Q   But you agree that the acronym BFD, to refer to    11:14AM
15  Bidirectional Forwarding Detection, appears in        11:14AM
16  Exhibit 55?                                       11:14AM
17  A   Yes, that is correct.  I see that.                11:14AM
18  Q   Yeah.  Okay.                                    11:14AM
19      Would you please turn to the second page of the   11:14AM
20  document under Section 2, and I'm looking at the      11:14AM
21  section -- Section 2 with the heading "Applications and  11:14AM
22  Limitations."                                     11:14AM
23      Do you see that?                               11:14AM
24  A   Yes, I see that.                               11:14AM
25  Q   Under that, it says, "This application of BFD can  11:14AM

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1   be used by any pair of systems communicating via IPv4   11:14AM
2   and/or IPv6 across a single IP hop that is associated   11:14AM
3   with an incoming interface."                      11:14AM
4       Do you see that language?                      11:14AM
5   A   Yes, I see that.                               11:14AM
6   Q   Under the BFD standard, is BFD enabled for a       11:14AM
7   specific interface?                               11:15AM
8       MR. NEUKOM: Objection; vague, calls for opinion  11:15AM
9   testimony.                                        11:15AM
10      THE WITNESS: So I don't remember the complete     11:15AM
11  details of the document.  My closest recollection is the  11:15AM
12  specified -- as -- the line you just quoted, it is a    11:15AM
13  technology where two devices on a single interface can   11:15AM
14  detect each other in a faster way.                 11:15AM
15  BY MR. SILBERT:                                    11:15AM
16  Q   Okay.  Sorry to jump around on you, but I'm going  11:15AM
17  to do this -- I'm going to warn you, I'm going to do    11:15AM
18  this some today.                                  11:15AM
19      Could you look back at Exhibit 54 -- or,         11:15AM
20  actually, strike that.  That's okay.              11:16AM
21      What -- what is the function of the             11:16AM
22  "bfd all-interfaces" command in Cisco IOS?          11:16AM
23  A   So BFD -- I mean, this is a slightly longer       11:16AM
24  answer, so BFD -- we just looked at the spec.  This is  11:16AM
25  the technology where, on a per-interface basis between  11:16AM

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1   two devices, you can set up this functionality to detect  11:16AM
2   whoever goes down faster, right?                   11:16AM
3       When we ship this technology to our customers,   11:16AM
4   what we realized is they have a lot of such interfaces,  11:16AM
5   and if you had, let's say, a hundred interfaces, it was  11:16AM
6   quite cumbersome to go and configure, on each interface,  11:16AM
7   that I really want to protect myself; I really want BFD  11:16AM
8   enabled                                          11:17AM
9       So what we came up with is: What if we gave you  11:17AM
10  a shorthand which you can configure at a higher       11:17AM
11  construct?                                        11:17AM
12      So the example I was giving earlier is, in       11:17AM
13  OSPF -- OSPF Version 3, in the router context -- not in  11:17AM
14  the interface context, in the router context -- you can  11:17AM
15  go and say, BFD, please configure for all interfaces    11:17AM
16      And that simplifies the operational aspect, and  11:17AM
17  customers can now just do this versus having to go to   11:17AM
18  each interface and enabling one at a time, so that's the  11:17AM
19  primary intent based on the feedback we got          11:17AM
20  Q   Okay  And so just to make sure that I            11:17AM
21  understand, the "bfd all-interfaces" command enables BFD  11:17AM
22  for all interfaces; is that correct?               11:17AM
23      MR NEUKOM: Objection; misstates prior           11:17AM
24  testimony                                         11:17AM
25      THE WITNESS: I would add little bit to that  In  11:17AM

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1 the context of a certain routing protocol -- 11:17AM
2     MR. SILBERT: Okay. 11:17AM
3     THE WITNESS: -- it enables BFD for all 11:18AM
4 interfaces where that routing protocol is enabled, but, 11:18AM
5 yeah. 11:18AM
6 BY MR. SILBERT: 11:18AM
7   Q Okay. We discussed earlier the fact that you 11:18AM
8 don't know who came up with the expression 11:18AM
9 "bfd all-interfaces"; is that correct? 11:18AM
10    MR. NEUKOM: Objection; misstates prior 11:18AM
11 testimony. 11:18AM
12    THE WITNESS: Yeah, so as I said earlier, this 11:18AM
13 was a set of engineers who were working on this across 11:18AM
14 multiple protocols, and it's collaborative. I can't 11:18AM
15 pinpoint to specific engineer who probably suggested 11:18AM
16 these exact words. 11:18AM
17 BY MR. SILBERT: 11:18AM
18   Q Okay. And I take it that you also don't know 11:18AM
19 what sources that engineer or those engineers referred 11:18AM
20 to in coming up with that expression; is that correct? 11:19AM
21    MR. NEUKOM: Objection; misstates prior 11:19AM
22 testimony. 11:19AM
23    THE WITNESS: Yeah, so, I mean, I can't recollect 11:19AM
24 what -- what sources they used to come up with this 11:19AM
25 exactly. 11:19AM

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1 BY MR SILBERT: 11:19AM
2   Q What was your personal involvement, if any, in 11:19AM
3 naming the "bfd all-interfaces" command? 11:19AM
4   A So I remember the implementation part of the 11:19AM
5 command where I was a developer writing the code and 11:19AM
6 implementing the command 11:19AM
7     In the naming part, as I said, I don't quite 11:19AM
8 recollect was it my idea or was it a collaborative idea 11:19AM
9 which finally came to these exact choice of words, yeah, 11:19AM
10 so I don't recall Probably participated in the 11:19AM
11 discussion of coming to this exact command syntax 11:19AM
12   Q Okay Where you say "probably participated in 11:19AM
13 the discussion," do you have any recollection of 11:20AM
14 participating in a discussion that came to this exact 11:20AM
15 command syntax? 11:20AM
16   A Yeah, so no specific recollection 11:20AM
17   Q Do you have a general recollection of 11:20AM
18 participating in that discussion? 11:20AM
19   A The general recollection is, again, based on some 11:20AM
20 of the earlier comments I made The -- the way we 11:20AM
21 actually design a new command is the team talks about 11:20AM
22 it The team brainstorms about it, and I was part of 11:20AM
23 the team working at that time, so it will be hard to 11:20AM
24 believe that I was hiding under the table not really 11:20AM
25 doing anything, so I was probably participating That's 11:20AM

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1 where the "probably" comes from 11:20AM
2   Q Okay But you don't have any actual image in 11:20AM
3 your head of those discussions; is that right? 11:20AM
4   A That's correct 11:20AM
5   Q Okay Why don't you go back to -- let's -- let's 11:20AM
6 look again at Exhibit 54, this table, and would you 11:20AM
7 please turn to page 12 11:20AM
8     Do you see, a little more than midway down the 11:21AM
9 page, the Command Expression in the left-hand column 11:21AM
10 "ip ospf authentication"? 11:21AM
11   A Yeah, I see that 11:21AM
12   Q Okay And do you see the next column with the 11:21AM
13 heading "Author/Originator Information"? It says 11:21AM
14 "Cisco" and then your name? 11:21AM
15   A Yes, I see that 11:21AM
16   Q Did you come up with the expression "ip ospf 11:21AM
17 authentication"? 11:21AM
18   A I'll probably give you a similar answer; that I 11:21AM
19 was part of the team who were working on it Was this 11:21AM
20 purely me or was it a combined brainstorming with the 11:21AM
21 team, I don't have specific recollection 11:21AM
22   Q Okay And similar to the "bfd all-interfaces" 11:22AM
23 command that we discussed, do you have any knowledge of 11:22AM
24 what person or persons actually came up with the 11:22AM
25 expression "ip ospf authentication"? 11:22AM

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1     MR. NEUKOM: Objection; asked and answered. 11:22AM
2     THE WITNESS: Yeah, no specific names I can cite, 11:22AM
3 but, again, this is similar to what I said. The team 11:22AM
4 talks about it and comes up with the name. Who -- who 11:22AM
5 seeded the word or part of the word and how we arrived 11:22AM
6 at the final word, no specific recollection. 11:22AM
7 BY MR. SILBERT: 11:22AM
8   Q Okay. And, again, I -- I'm assuming this is 11:22AM
9 true, but correct me if I'm wrong. 11:22AM
10     You -- you have no image in your head of any 11:22AM
11 discussions surrounding this particular term with 11:22AM
12 respect to coming up with this expression? 11:23AM
13   A That's correct, no specific recollection. 11:23AM
14   Q Okay. What is the function of the command 11:23AM
15 "ip ospf authentication"? 11:23AM
16   A This command is at a -- at a interface level, if 11:23AM
17 I remember, and what this does is if -- if two devices 11:23AM
18 are talking OSPF, you can configure both devices to -- 11:23AM
19 to do some level of encoding in the packets so that they 11:23AM
20 can validate each other. There are different types of 11:23AM
21 authentication. There is -- if I remember, again, 11:23AM
22 correctly, there is a clear text authentication. There 11:23AM
23 is a message digest -- digest authentication, and I 11:23AM
24 think those are the -- those are the additional keywords 11:23AM
25 associated with this command. 11:24AM

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1  Q  Okay. What's the significance of the term "ip"  11:24AM
2  at the start of this command?  11:24AM
3  A  IP -- I think we -- we kept "ip" as the top-level  11:24AM
4  keyword for things which were related to IP before, so  11:24AM
5  "ip" really implies IP Version 4.  11:24AM
6  Q  Okay. And just to back up for a second, IP  11:24AM
7  stands for Internet protocol; correct?  11:24AM
8  A  That is correct.  11:24AM
9  Q  And IPv4 stands for -- or refers to Version 4 of  11:24AM
10  the Internet protocol; is that correct?  11:24AM
11  A  That is correct. That is correct.  11:24AM
12  Q  And the Internet protocol is specified in a  11:24AM
13  standard published by the IETF; correct?  11:24AM
14  A  That it's correct.  11:24AM
15  Q  And IPv4 is specified in a standard published by  11:24AM
16  the IP -- IETF; correct?  11:25AM
17  A  Yes, that's correct.  11:25AM
18  Q  Okay. The acronym IP was used by the industry to  11:25AM
19  refer to Internet protocol before Cisco used it in CLI  11:25AM
20  commands; correct?  11:25AM
21  MR. NEUKOM: Objection; foundation.  11:25AM
22  THE WITNESS: So the term "IP," just like we  11:25AM
23  discussed for BFD -- right? -- when you write Internet  11:25AM
24  standard, you try to abbreviate technologies, and,  11:25AM
25  again, we can look at that document and confirm that's  11:25AM

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1  true or not  I'm guessing it says Internet protocol and  11:25AM
2  that abbreviates it as "IP," and the document refers to  11:25AM
3  that so that you don't have to keep saying "Internet  11:25AM
4  protocol" or "Internet Protocol Version 4 "  11:25AM
5  MR NEUKOM: By the way, David, while you are  11:26AM
6  getting a new document, just as a housekeeping matter,  11:26AM
7  30 minutes or so ago I objected to a question you asked  11:26AM
8  the witness on the basis of attorney-client privilege,  11:26AM
9  and I meant to have objected on the basis of attorney  11:26AM
10  work product  11:26AM
11  MR SILBERT: Okay  11:26AM
12  MR NEUKOM: So  11:26AM
13  BY MR SILBERT:  11:26AM
14  Q  This is -- let me show you a document that's  11:26AM
15  already been marked as Exhibit 29 in this case  11:26AM
16  Do you recognize this document?  11:26AM
17  A  Yes, I do  11:27AM
18  Q  What is it?  11:27AM
19  A  This is an RFC which details the Internet  11:27AM
20  protocol  11:27AM
21  Q  And the publication date shown here is  11:27AM
22  September 1981; correct?  11:27AM
23  A  Yes, that is correct  11:27AM
24  Q  And was this, to your knowledge, the first  11:27AM
25  version of the Internet protocol that's described in  11:27AM

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1  this document, Exhibit 29?  11:27AM
2  MR. NEUKOM: Objection; foundation.  11:27AM
3  THE WITNESS: So I'm just reading page 1 -- or  11:27AM
4  what you have in your bottom as 1557. Just below the  11:27AM
5  RFC 791, it says, Replaces RFC 760, which generally  11:27AM
6  implies there was prior work, which -- which his  11:27AM
7  supersedes.  11:27AM
8  BY MR. SILBERT:  11:28AM
9  Q  Okay. And forgive me if I've asked you this --  11:28AM
10  (Discussion off the stenographic record.)  11:28AM
11  BY MR. SILBERT:  11:28AM
12  Q  I apologize if I've asked you this already, but  11:28AM
13  have -- have you heard the Internet protocol abbreviated  11:28AM
14  IP outside the context of Cisco?  11:29AM
15  A  As in what are the other possible abbreviations?  11:29AM
16  For example, intellectual property we use "IP" term all  11:29AM
17  the time.  11:29AM
18  Q  We do that too. No.  11:29AM
19  My question is: Have you heard the abbreviation  11:29AM
20  IP used to refer to the Internet protocol outside the  11:29AM
21  context of Cisco?  11:29AM
22  MR. NEUKOM: Objection; vague.  11:29AM
23  THE WITNESS: So in -- in IETF -- as part of my  11:29AM
24  role in IETF, people do loosely refer Internet Protocol  11:29AM
25  Version 6 as "IP," as -- as one -- one of the variants.  11:29AM

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1  There are, again, multiple ways to say that  11:29AM
2  BY MR SILBERT:  11:29AM
3  Q  Have you heard the expression "TCP/IP"?  11:29AM
4  A  Yes, I have  11:29AM
5  Q  Do you know what the IP stands for in that  11:29AM
6  expression?  11:29AM
7  A  That is the Internet protocol  11:30AM
8  Q  Okay  And that's the same Internet protocol that  11:30AM
9  we have been discussing here this morning; correct?  11:30AM
10  A  Correct  11:30AM
11  Except in -- when you say "TCP/IP," it's probably  11:30AM
12  a little broader because it does not imply which IP  11:30AM
13  version you might be using  For example, you may be  11:30AM
14  using IP with IP Version 6, or you may be using  11:30AM
15  IP Version 4  It's a slightly broader term  11:30AM
16  Q  Okay  I think you mentioned this previously, but  11:30AM
17  before somebody came up with the expression "ip ospf  11:30AM
18  authentication," Cisco used "IP" as a top-level keyword  11:30AM
19  in other commands; correct?  11:30AM
20  A  That is correct  11:30AM
21  Q  And so when someone came up with the expression  11:31AM
22  "ip ospf authentication," they followed that same  11:31AM
23  syntax; correct?  11:31AM
24  MR NEUKOM: Objection; vague  11:31AM
25  THE WITNESS: Authentication keyword, when it was  11:31AM

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| | |
|---|---|
| 1 introduced -- again, I'm trying to recollect from my 11:31AM | 1 A Yes 11:34AM |
| 2 20-year-old memory IP OSPF existed in the sense that 11:31AM | 2 MR NEUKOM: Objection; misstates prior 11:34AM |
| 3 there were commands with IP OSPF some other options It 11:31AM | 3 testimony 11:34AM |
| 4 made sense to attach authentication to that chain 11:31AM | 4 THE WITNESS: Yes I don't have, again, specific 11:34AM |
| 5 already rather than sort of create something brand new 11:31AM | 5 recollection of what sort of documentation or documents 11:34AM |
| 6 BY MR SILBERT: 11:31AM | 6 we wrote at that time 11:34AM |
| 7 Q Okay And, in fact, if you look below -- looking 11:31AM | 7 BY MR SILBERT: 11:34AM |
| 8 still at Exhibit 54, if you look immediately below "ip 11:31AM | 8 Q Okay We have talked a little bit about OSPF 11:34AM |
| 9 ospf authentication," do you see the entry for "ip ospf 11:31AM | 9 There's an OSPF standard that's published by 11:34AM |
| 10 authentication-key"? 11:32AM | 10 IETF; correct? 11:34AM |
| 11 A Yes, I see that 11:32AM | 11 MR NEUKOM: Objection; vague 11:34AM |
| 12 Q And the -- if you look there, the date of the 11:32AM | 12 THE WITNESS: So OSPF is basically Open Shortest 11:34AM |
| 13 earliest-known document that's listed for that 11:32AM | 13 Path First It's one of the routing protocols OSPF 11:34AM |
| 14 expression is 1993, which is five years or so earlier 11:32AM | 14 has had multiple IETF standards published over time, and 11:34AM |
| 15 than the date listed for "ip ospf authentication"; is 11:32AM | 15 as we just saw, in the case of IP, sometimes the newer 11:35AM |
| 16 that correct? 11:32AM | 16 one deprecate the older one and so on, so there are 11:35AM |
| 17 A That's what this document says, yes 11:32AM | 17 multiple standards out there related to OSPF 11:35AM |
| 18 Q Do you know what the person or persons who came 11:32AM | 18 MR SILBERT: Okay 11:35AM |
| 19 up with the expression "ip ospf authentication" referred 11:32AM | 19 (Exhibit 56 was marked for 11:35AM |
| 20 to when coming up with that expression? 11:32AM | 20 identification by the Court Reporter) 11:35AM |
| 21 A Are you asking for the previous command, which is 11:32AM | 21 BY MR SILBERT: 11:35AM |
| 22 the "ip ospf authentication" -- 11:32AM | 22 Q Mr Roy, would you please look at Exhibit 56 and 11:36AM |
| 23 Q Yes 11:32AM | 23 tell me if you recognize it 11:36AM |
| 24 A -- or the "key" command -- 11:32AM | 24 A Yes, I do 11:36AM |
| 25 Q No 11:32AM | 25 Q What is it? 11:36AM |
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| | |
|---|---|
| 1 A -- the previous -- okay 11:32AM | 1 A This is another of OSPF standards RFC, which 11:36AM |
| 2 Q Yeah 11:32AM | 2 specifies OSPF protocol, protocol specification. 11:36AM |
| 3 A "Ip ospf authentication" referred to enabling the 11:32AM | 3 Q And this document states that it was published in 11:36AM |
| 4 authentification features -- as we said, it could be 11:33AM | 4 October 1989; correct? 11:36AM |
| 5 clear text or it could be message digest -- on that 11:33AM | 5 A That is correct. 11:36AM |
| 6 interface 11:33AM | 6 Q And the author listed here is someone named 11:36AM |
| 7 Q Yeah, I apologize because my question -- 11:33AM | 7 J. Moy, M-o-y; is that correct? 11:36AM |
| 8 A Okay 11:33AM | 8 A Yes. John Moy was the author. 11:36AM |
| 9 Q -- wasn't clear 11:33AM | 9 Q And the company where he's listed as working is 11:36AM |
| 10 What I actually was trying to ask you was: Do 11:33AM | 10 Proteon, Inc.; is that correct? 11:37AM |
| 11 you know what documents or source materials the people 11:33AM | 11 A Correct, so at the time of publication of this 11:37AM |
| 12 who came up with the expression "ip ospf authentication" 11:33AM | 12 document, he was employed by Proteon, Inc. 11:37AM |
| 13 referred to when naming that command? 11:33AM | 13 Q Do you know Mr. Moy? 11:37AM |
| 14 A So I can't tell you anything very specific, but 11:33AM | 14 A Yes, I do. 11:37AM |
| 15 what typically happens, I can say, is when you write a 11:33AM | 15 Q Did he ever work for Cisco? 11:37AM |
| 16 new command, of course, you will see source code 11:33AM | 16 A Not that I know of. 11:37AM |
| 17 changes, which looks like it refers to You may also 11:33AM | 17 Q This document, in its title, uses the acronym 11:37AM |
| 18 produce customer-facing documents For example, we saw 11:33AM | 18 OSPF; correct? 11:37AM |
| 19 command reference where also this will get documented as 11:33AM | 19 A Yes, it does. 11:37AM |
| 20 what it does and what the syntax is and so on 11:33AM | 20 Q Who -- who came up with that acronym, to your 11:37AM |
| 21 Q Okay And just to be clear, you are saying 11:33AM | 21 knowledge? 11:37AM |
| 22 that's what typically happens because you don't know 11:34AM | 22 A So I think I'll give you the same answer I gave 11:37AM |
| 23 what the person or persons who named the command 11:34AM | 23 for BFD. If you move to the page 1, which is 2601 in 11:37AM |
| 24 "ip ospf authentication" actually referred to when they 11:34AM | 24 the bottom-right label, and if you see Section 1, talks 11:37AM |
| 25 named that command; is that correct? 11:34AM | 25 about the first time that abbreviation was introduced, 11:37AM |
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1 and that's very typical in IETF standards, that the long    11:38AM
2 things we create acronym at the first reference and    11:38AM
3 continue to use it in this document    11:38AM
4    Q   So my question is just this: So far as you know,    11:38AM
5 someone outside of Cisco came up with the acronym OSPF;    11:38AM
6 correct?    11:38AM
7    A   So IETF -- IETF products is a complicated    11:38AM
8 process, and let me just give you a quick glimpse of it    11:38AM
9       What you are seeing is the finished product,    11:38AM
10 which John Moy was the lead author and he took it to the    11:38AM
11 RFC    11:38AM
12       What happened before that and how many versions    11:38AM
13 were there and who are the people who sort of worked and    11:38AM
14 collaborated to get to this stage, you can find that    11:38AM
15 information, that -- how many earlier revisions of the    11:38AM
16 drafts are there, who are the collaborator, where they    11:38AM
17 worked for -- whichever companies they worked for,    11:39AM
18 right? -- and how did they come to this    11:39AM
19       So it's hard to say, just looking at this, who    11:39AM
20 came with this and who coined the term or who coined the    11:39AM
21 acronym OSPF    11:39AM
22    Q   Okay  But nevertheless, that acronym was in    11:39AM
23 common usage before it was used by Cisco in a CLI    11:39AM
24 command; correct?    11:39AM
25       MR NEUKOM: Objection; calls for opinion    11:39AM

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1 testimony.    11:39AM
2       THE WITNESS: So I don't know when Cisco    11:39AM
3 implemented OSPF first, so it's hard to say what    11:39AM
4 happened first.    11:39AM
5       Again, a corollary comment, a lot of times Cisco    11:39AM
6 is -- is the driver of technologies, and we implement    11:39AM
7 things, and then we publish standards off it, so there    11:39AM
8 could be a coincidence where it has been used in Cisco    11:39AM
9 before or -- or in a standard document before -- again,    11:39AM
10 I don't know enough history on this that what happened    11:40AM
11 when.    11:40AM
12 BY MR. SILBERT:    11:40AM
13    Q   Okay.  You are going to agree with me, though, I    11:40AM
14 think, that the standard itself uses the acronym OSPF;    11:40AM
15 right?    11:40AM
16    A   The document does create the acronym for the use    11:40AM
17 for the document.    11:40AM
18    Q   Okay.  Would you turn to the page that ends in    11:40AM
19 the Bates No. 622?    11:40AM
20       MR. NEUKOM: Sorry, what page, David?    11:40AM
21       MR. SILBERT: Bates No. 622.    11:40AM
22       MR. NEUKOM: Okay.  Thank you.    11:41AM
23 BY MR. SILBERT:    11:41AM
24    Q   Do you see Section 6 that's with the heading "The    11:41AM
25 Area Data Structure"?    11:41AM

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1    A   Yeah, I see that.    11:41AM
2    Q   What is an area data structure in OSPF?    11:41AM
3       MR. NEUKOM: Objection; calls for opinion    11:41AM
4 testimony.    11:41AM
5       THE WITNESS: So "data structure" is -- is a    11:41AM
6 computer science terminology which is how you store    11:41AM
7 data, potentially, in a software implementation.    11:41AM
8       "Area" is a concept introduced in this RFC    11:41AM
9 which -- which refers to a collection of devices which    11:42AM
10 have -- which are in the same area -- or who make a    11:42AM
11 collective decision together by -- by knowing each    11:42AM
12 other's state up front.    11:42AM
13       So Internet data structure, I think, is going    11:42AM
14 into, if you had such a collection of objects, these are    11:42AM
15 the objects you probably want to keep in that collection    11:42AM
16 of objects.    11:42AM
17 BY MR. SILBERT:    11:42AM
18    Q   Okay.  Okay.  Would you look at two pages more    11:42AM
19 at -- on the page that ends with the Bates No. 624.    11:42AM
20    A   Yes.    11:42AM
21    Q   And do you see the bolded term "authentication    11:42AM
22 type"? It's in the top third --    11:42AM
23    A   Yes, I see that.    11:42AM
24    Q   -- of the page?    11:42AM
25    A   Yeah, I see that.    11:42AM

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1    Q   Under the OSPF standard, does an operator specify    11:42AM
2 the authentification type to be used for an area?    11:43AM
3       MR. NEUKOM: Objection; vague, calls for opinion    11:43AM
4 testimony    11:43AM
5       THE WITNESS: So as per this document, what was    11:43AM
6 described here is in a area you could specify if    11:43AM
7 authentication is in use, and I think it also refers to    11:43AM
8 this other section where you can find details of what    11:43AM
9 types of authentication, Appendix E    11:43AM
10       As a -- as a operator, you may or may not choose    11:43AM
11 to have authentication  That is totally up to you  If    11:43AM
12 you think your network is very secure, you may choose to    11:43AM
13 not have authentication  If you really want to secure    11:43AM
14 your network, there are a variety of ways to    11:43AM
15 authenticate it, and this just refers to that -- what    11:43AM
16 mechanisms exist at the area level    11:44AM
17 BY MR SILBERT:    11:44AM
18    Q   Okay  And would you agree that authentication is    11:44AM
19 a concept that's introduced in this OSPF specification?    11:44AM
20       MR NEUKOM: Objection; calls for opinion    11:44AM
21 testimony and vague    11:44AM
22       THE WITNESS: This document has used the term    11:44AM
23 "authentication," but basically what we are talking    11:44AM
24 about is: Are there ways -- are there ways to validate?    11:44AM
25 Are there ways to secure communication between devices?    11:44AM

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| | |
|---|---|
| 1    MR SILBERT: Okay  We need to change the tape,  11:44AM | 1    Q  -- there is a bold entry "authentication type."   12:25PM |
| 2  so we will have to pause there                    11:44AM | 2      Do you see that?                          12:25PM |
| 3      THE VIDEOGRAPHER: This marks the end of        11:44AM | 3    A  Yes.                                    12:25PM |
| 4  Volume 1, Media No 1 of the deposition of Abhay Roy     11:44AM | 4      Yeah, so what -- what that -- in the -- what     12:25PM |
| 5      The time is 11:44 a m  We are off the record    11:44AM | 5  is -- what it's trying to say in the RFC is if you have  12:25PM |
| 6    (Lunch recess taken )                     11:44AM | 6  for area some objects -- one of the objects is the      12:25PM |
| 7        ---o0o---           11:44AM | 7  authentication type.  That's what that document is     12:25PM |
| 8                          11:44AM | 8  talking about.                              12:25PM |
| 9 | 9    Q  And the -- the document is getting at the idea     12:25PM |
| 10 | 10  that an operator can set the authentification type for    12:25PM |
| 11 | 11  objects in an area; correct?                  12:25PM |
| 12 | 12      MR. NEUKOM: Objection; document speaks for      12:25PM |
| 13 | 13  itself, calls for opinion testimony.              12:25PM |
| 14 | 14      THE WITNESS: Yeah, so document is talking about, 12:26PM |
| 15 | 15  at the area scope, if you support authentication, you     12:26PM |
| 16 | 16  probably want to store objects related to the          12:26PM |
| 17 | 17  authentication in that type of data store.           12:26PM |
| 18 | 18  BY MR. SILBERT:                          12:26PM |
| 19 | 19    Q  Okay.  So looking at the command "ip ospf       12:26PM |
| 20 | 20  authentication," the term "ip" in that command refers to  12:26PM |
| 21 | 21  the Internet protocol standard; right?             12:26PM |
| 22 | 22      MR. NEUKOM: Objection; misstates prior          12:26PM |
| 23 | 23  testimony.                              12:26PM |
| 24 | 24      THE WITNESS: "ip" in that command refers to      12:26PM |
| 25 | 25  Internet Protocol Version 4.                   12:26PM |
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| | |
|---|---|
| 1  AFTERNOON SESSION            12:24 P M  11:44AM | 1  BY MR SILBERT:                          12:26PM |
| 2                          12:24PM | 2    Q  Okay  And that's a standard that's published by  12:26PM |
| 3      THE VIDEOGRAPHER: We are back on the record at    12:24PM | 3  the IETF; correct?                        12:26PM |
| 4  12:24 p m                        12:24PM | 4    A  Internet protocol is an RFC 791, which is       12:26PM |
| 5      This marks the beginning of Volume 1, Media No  2  12:24PM | 5  published by the IETF, yes                   12:26PM |
| 6  of the deposition of Abhay Roy               12:24PM | 6    Q  Right                              12:27PM |
| 7      Please continue                    12:24PM | 7      And -- and 791 might be an earlier version, but   12:27PM |
| 8  BY MR SILBERT:                       12:24PM | 8  are you aware that there's a separate RFC that's a      12:27PM |
| 9    Q  Good afternoon, Mr Roy             12:24PM | 9  standard for Internet Protocol 4?               12:27PM |
| 10      Before the lunch break, we were talking about the  12:24PM | 10    A  I don't know exactly if -- if there is a one --   12:27PM |
| 11  command "ip ospf authentication "            12:24PM | 11  there is a version later than this which supersedes      12:27PM |
| 12      Do you recall that?               12:24PM | 12  this --                               12:27PM |
| 13    A  Yes, I do                        12:24PM | 13    Q  Okay                             12:27PM |
| 14    Q  Do you agree that authentication is a parameter    12:24PM | 14    A  -- but there might be; might not be not aware     12:27PM |
| 15  that's introduced in the OSPF specification?         12:24PM | 15    Q  Okay  And in the command "ip ospf           12:27PM |
| 16      MR NEUKOM: Objection; vague, calls for opinion  12:24PM | 16  authentication," "ospf" refers to the OSPF           12:27PM |
| 17      THE WITNESS: I think you referred me to some      12:24PM | 17  specification, Exhibit 56; correct?              12:27PM |
| 18  section  Could you point me to that again?          12:24PM | 18      MR NEUKOM: Objection; misstates prior          12:27PM |
| 19      MR SILBERT: Yeah  We were looking at the page  12:24PM | 19  testimony                             12:27PM |
| 20  that ends in Bates No 624 in Exhibit 56, which is the    12:24PM | 20      THE WITNESS: So OSPF command -- or this command,  12:27PM |
| 21  OSPF specification dated October 1989            12:25PM | 21  which is in Cisco's implementation, refers to the       12:27PM |
| 22      THE WITNESS: Was that 624?             12:25PM | 22  protocol called "OSPF," which is documented in an IETF   12:27PM |
| 23      MR SILBERT: Yes                    12:25PM | 23  stand -- IETF RFC                        12:28PM |
| 24    Q  Yeah, in the top third of the page --        12:25PM | 24  BY MR SILBERT:                          12:28PM |
| 25    A  Oh, yes  Yes  Sorry, my bad             12:25PM | 25    Q  Okay  And in the term "ip ospf authentication,"  12:28PM |
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| | |
|---|---|
| 1 the term "authentication" refers to an authentication 12:28PM | 1 drawn on in coming up with the expression "ip ospf 12:30PM |
| 2 parameter that's described in the OSPF standard; 12:28PM | 2 authentication"; correct? 12:31PM |
| 3 correct? 12:28PM | 3 MR NEUKOM: Objection; asked and answered 12:31PM |
| 4 MR NEUKOM: Objection; calls for opinion 12:28PM | 4 THE WITNESS: Resources -- could you -- could you 12:31PM |
| 5 testimony and document speaks for itself 12:28PM | 5 rephrase what resources? 12:31PM |
| 6 THE WITNESS: So OSPF RFC does use the language 12:28PM | 6 MR SILBERT: Sure 12:31PM |
| 7 "authentication," and Cisco's CLI also happens to use 12:28PM | 7 Q Do you know if the person or people who came up 12:31PM |
| 8 the language "authentication"; although, we are 12:28PM | 8 with this expression had the OSPF standard in front of 12:31PM |
| 9 primarily talking about how to secure, how to validate 12:28PM | 9 them when they came up with the expression? 12:31PM |
| 10 OSPF packets, really 12:28PM | 10 A Again, I can't say that with -- with certainty 12:31PM |
| 11 BY MR SILBERT: 12:28PM | 11 They may or may not have referred to the standard 12:31PM |
| 12 Q Okay Are you saying that your command uses 12:28PM | 12 Q Okay And do you know whether the person or 12:31PM |
| 13 "authentication" in a different way than the standard 12:28PM | 13 people who came up with this expression derived it from 12:31PM |
| 14 does? 12:28PM | 14 a pre-existing expression? 12:31PM |
| 15 A So the -- so the section we are looking at in the 12:28PM | 15 MR NEUKOM: Objection; calls for opinion 12:31PM |
| 16 standard is at the area scope versus the command we are 12:28PM | 16 testimony and legal conclusion 12:31PM |
| 17 looking at is at the interface scope They are two 12:29PM | 17 THE WITNESS: Yeah, so I have some more context 12:31PM |
| 18 different things The scope is different 12:29PM | 18 on that 12:31PM |
| 19 Q I see Okay 12:29PM | 19 What you just saw in -- in the RFC -- what I was 12:31PM |
| 20 I think we have covered this in general, but I 12:29PM | 20 saying, it's area scope -- Cisco actually supports that 12:31PM |
| 21 just want to be clear 12:29PM | 21 command also There is a similar command at the area 12:31PM |
| 22 Is it correct that you do not know who actually 12:29PM | 22 scope 12:32PM |
| 23 named the command "ip ospf authentication" at Cisco? 12:29PM | 23 When -- when we did this, this was sort of over 12:32PM |
| 24 A So as I -- as I have said in the past, I was part 12:29PM | 24 and beyond what standards do, and this is where Cisco's 12:32PM |
| 25 of the team I did participate in the team to come up 12:29PM | 25 value-add came in We saw people who wanted to do this 12:32PM |
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| 1 with this. Was it exactly my idea or somebody else's 12:29PM | 1 type of behavior in specific interfaces and not all 12:32PM |
| 2 idea? That I don't specifically recall, but I was part 12:29PM | 2 interfaces which are part of an area So this was 12:32PM |
| 3 of the team who came up with the -- the keyword, and I 12:29PM | 3 created to be similar to what the area command Cisco 12:32PM |
| 4 was part of the team which was doing the implementation. 12:29PM | 4 already has 12:32PM |
| 5 Q Okay. And it's -- you have no memory of the 12:29PM | 5 BY MR SILBERT: 12:32PM |
| 6 actual process of coming up with this command; correct? 12:29PM | 6 Q Okay And is that area command that Cisco 12:32PM |
| 7 MR. NEUKOM: Objection; misstates prior 12:29PM | 7 already had "ip ospf authentication-key"? 12:32PM |
| 8 testimony. 12:30PM | 8 A No That is -- we are still looking at interface 12:32PM |
| 9 THE WITNESS: Specifically what happened for this 12:30PM | 9 scope commands It will be probably in a different 12:32PM |
| 10 particular command and what process, I don't have a 12:30PM | 10 context It will be under routing context, and the 12:32PM |
| 11 specific memory, but as I have said earlier, the way the 12:30PM | 11 command will be called different I don't recall what 12:32PM |
| 12 process is, is one or -- or more engineers come up with 12:30PM | 12 the command is exactly called, but that is not the 12:32PM |
| 13 certain set of keywords. We have a discussion. And 12:30PM | 13 command 12:32PM |
| 14 then we arrive at what finally happens. And then there 12:30PM | 14 Q Okay What -- what is the command that you are 12:32PM |
| 15 was more about parser police, but I'll not go into that. 12:30PM | 15 saying the command "ip ospf authentication" was designed 12:33PM |
| 16 BY MR. SILBERT: 12:30PM | 16 to be similar to? 12:33PM |
| 17 Q Okay. And with respect to this command, you 12:30PM | 17 MR NEUKOM: Objection; misstates prior 12:33PM |
| 18 don't know who came up with the expression; correct? 12:30PM | 18 testimony 12:33PM |
| 19 MR. NEUKOM: Objection; asked and answered. 12:30PM | 19 THE WITNESS: I don't recall the exact syntax of 12:33PM |
| 20 THE WITNESS: So I participated in the team of 12:30PM | 20 that command, but it will be -- it will be in a 12:33PM |
| 21 engineers who came up with this, but I can't tell you 12:30PM | 21 different context It will be in the router context, 12:33PM |
| 22 exactly the engineer who uttered the word, "This is 12:30PM | 22 not in the interface context 12:33PM |
| 23 exactly what we should call it." 12:30PM | 23 BY MR SILBERT: 12:33PM |
| 24 BY MR. SILBERT: 12:30PM | 24 Q How would I find that command if I wanted to find 12:33PM |
| 25 Q Okay. And you don't know what resources were 12:30PM | 25 it? 12:33PM |
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24 (Pages 90 - 93)

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| | |
|---|---|
| 1   A  If you saw a complete reference of OSPF        12:33PM<br>2  configuration on a device, we could find it from there.  12:33PM<br>3   Q  What would I look for to find it?        12:33PM<br>4   A  You could search for keywords like "area" or       12:33PM<br>5  "authentication."        12:33PM<br>6   Q  Okay.  Who else was on the team who came up with  12:33PM<br>7  the command "ip ospf authentication"?        12:33PM<br>8   A  So I'm trying to recollect who all were part of   12:34PM<br>9  the OSPF team.  There were probably a small set of        12:34PM<br>10  people.        12:34PM<br>11      Are you looking for specific names?        12:34PM<br>12   Q  Yes.        12:34PM<br>13   A  One person I could think of is Derek Yeung.        12:34PM<br>14   Q  Can you spell that, please.        12:34PM<br>15   A  Actually, he calls himself Derek, but the --        12:34PM<br>16  okay.  D-r-e-k [sic] and Yeung is Y-e-u-n-g.        12:34PM<br>17   Q  Okay.        12:34PM<br>18   A  He was -- he was one of the senior guys in the        12:34PM<br>19  team.        12:34PM<br>20      Who were other people around that time.  There        12:34PM<br>21  was -- there was somebody called Padma, P-a-d-m-a.  Her  12:34PM<br>22  last name was Esnault, E-s-n-a-u-l-t.  And these two        12:34PM<br>23  names I can remember very clearly.  There may be more        12:35PM<br>24  people who were part of the OSPF team at that time.        12:35PM<br>25   Q  Is that the best recollection you have, as you        12:35PM<br>Page 94 | 1  A-c-e-e, Lindem, L-i-n-d-e-m, but I'm not 100 percent     12:37PM<br>2  sure if he was still on that team or he left Cisco by     12:37PM<br>3  that time.        12:37PM<br>4   Q  Okay.  Can you remember any other names of people  12:37PM<br>5  who were on the team?        12:37PM<br>6   A  Nothing is coming to my head.        12:37PM<br>7   Q  Okay.  Referring back to Exhibit 54, would you     12:38PM<br>8  please turn to page 12.        12:38PM<br>9   A  Yeah, I'm there.        12:38PM<br>10   Q  In the bottom third of the page, do you see the    12:38PM<br>11  command expression "ip ospf bfd"?        12:38PM<br>12   A  Yes.        12:38PM<br>13   Q  Okay.  And then in the next column with the        12:38PM<br>14  heading "Author/Originator Information," it says "Cisco"  12:38PM<br>15  and your name; correct?        12:38PM<br>16   A  Yes.        12:38PM<br>17   Q  Did you come up with the expression "ip ospf     12:38PM<br>18  bfd"?        12:38PM<br>19   A  Yeah, so BFD -- I was the lead implementer of it  12:38PM<br>20  and very likely I proposed the -- the command.        12:39PM<br>21   Q  Okay.  And you say very likely you proposed the    12:39PM<br>22  command.        12:39PM<br>23      Do you have any recollection of doing that?        12:39PM<br>24   A  I don't remember anybody else worked on it, so     12:39PM<br>25  I -- I proposed the command.  Yeah, I think I proposed     12:39PM<br>Page 96 |
| 1  sit here today, of who else was on the team that came up  12:35PM<br>2  with the command "ip ospf authentication"?        12:35PM<br>3   A  Yes        12:35PM<br>4   Q  Okay  Who else was on the team that came up with  12:35PM<br>5  the command "bfd all-interfaces"?        12:35PM<br>6   A  That was on page 3?        12:35PM<br>7   Q  Correct        12:35PM<br>8      MR NEUKOM: Page 3 of Exhibit 54        12:35PM<br>9      THE WITNESS: This is actually much later than     12:36PM<br>10  that, so this -- I'm just going with the date, which is  12:36PM<br>11  also listed here, 2004 to 2005  We had different        12:36PM<br>12  engineers around that time on those PF [phonetic] team    12:36PM<br>13  Couple names I can recollect  One was Liem, L-i-e-m,        12:36PM<br>14  and Nguyen, N-g-y-u-e-n, I think  Last name may have        12:36PM<br>15  spelled incorrectly  Another engineer was Peter,        12:36PM<br>16  P-e-t-e-r, Psenak, P-s-e-n-a-k  There are probably more  12:36PM<br>17  names, but those are a couple of names        12:37PM<br>18  BY MR SILBERT:        12:37PM<br>19   Q  Okay  Are you able to tell me any other names of  12:37PM<br>20  people who are on the team who named the command        12:37PM<br>21  "bfd all-interfaces"?        12:37PM<br>22   A  Yeah, I don't recall any more specific names  I  12:37PM<br>23  mean, there are people around that time, but I want to   12:37PM<br>24  make sure that they were in Cisco at that time        12:37PM<br>25      For example, there is one engineer called Acee,  12:37PM<br>Page 95 | 1  the command  I don't think there was anybody else on     12:39PM<br>2  this project        12:39PM<br>3   Q  Okay  And I appreciate your reasons for saying     12:39PM<br>4  that, but my question is: Do you have any recollection  12:39PM<br>5  of proposing this command "ip ospf bfd"?        12:39PM<br>6   A  Yes        12:39PM<br>7      MR NEUKOM: Objection; asked and answered        12:39PM<br>8  BY MR SILBERT:        12:39PM<br>9   Q  What's your recollection?        12:39PM<br>10   A  I remember the document which described this, and  12:39PM<br>11  I think I was -- I was the author of the document  It's  12:39PM<br>12  a small amount of work  And generally what happens is    12:39PM<br>13  if there is large project, you have a larger group of    12:39PM<br>14  people who work on the project  For smaller ones, you    12:40PM<br>15  are the sole implementer, so you pretty much do most of  12:40PM<br>16  the work, all the way from designing the command and the  12:40PM<br>17  implementation  This was another smaller features        12:40PM<br>18   Q  Okay  The term "ip" in the command "ip ospf bfd"  12:40PM<br>19  refers to the Internet protocol standard that's        12:40PM<br>20  specified by the IETF; correct?        12:40PM<br>21   A  "ip" in this command refers to Internet Protocol  12:40PM<br>22  Version 4, which is documented in RFC 791, and there     12:40PM<br>23  might be further revisions of it, if not        12:40PM<br>24   Q  Okay  And the term "ospf" in the command        12:40PM<br>25  "ip ospf bfd" refers to the OSPF standard that's        12:40PM<br>Page 97 |

25 (Pages 94 - 97)

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1 specified by the IETF; correct? 12:40PM

2 A Yes 12:40PM

3 MR NEUKOM: Objection; misstates prior 12:41PM

4 testimony, calls for opinion 12:41PM

5 THE WITNESS: The OSPF acronym we have used is 12:41PM

6 for Open Shortest Path First protocol, which is also 12:41PM

7 described and captured in RFC 12:41PM

8 BY MR SILBERT: 12:41PM

9 Q Okay And the -- the term "bfd" in the command 12:41PM

10 "ip ospf bfd" refers to the BFD standard that's 12:41PM

11 specified by the IETF; correct? 12:41PM

12 A BFD acronym stands for Bidirectional Forwarding 12:41PM

13 Detection, which is -- which is, yes, also captured in 12:41PM

14 IETF RFC 12:41PM

15 Q And the BFD standard itself describes using BFD 12:41PM

16 with OSPF; is that correct? 12:41PM

17 MR NEUKOM: Objection; document calls for its -- 12:41PM

18 pardon me Document speaks for itself, calls for 12:42PM

19 opinion testimony 12:42PM

20 THE WITNESS: BFD spec -- again, my recollection 12:42PM

21 is BFD spec was written in a more generic sense It may 12:42PM

22 or may not have explicitly called out how and which 12:42PM

23 protocols you can -- you can make use of it, but, again, 12:42PM

24 if you have some more text, I can look into it 12:42PM

25 // 12:42PM

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1 (Exhibit 57 was marked for 12:42PM

2 identification by the Court Reporter ) 12:43PM

3 BY MR SILBERT: 12:43PM

4 Q Mr Roy, would you please look at Exhibit 57 and 12:43PM

5 tell me if you recognize it 12:43PM

6 A Yes, I do 12:43PM

7 Q What is it? 12:44PM

8 A This is an RFC which describes the base protocol 12:44PM

9 for bidirectional detection 12:44PM

10 Q Would you look, please, at the page that ends 12:44PM

11 with the Bates No 760 12:44PM

12 A Yes, I'm there 12:44PM

13 Q Do you see Section 3 1? Towards the bottom of 12:44PM

14 that section in that single paragraph, it says, "For 12:44PM

15 example, an OSPF implementation may request a BFD 12:44PM

16 session to be established to a neighbor discovered using 12:44PM

17 the OSPF Hello protocol " 12:44PM

18 Do you see that? 12:44PM

19 A Yes, I see that 12:44PM

20 Q And that sentence is describing using BFD with 12:44PM

21 OSPF; correct? 12:45PM

22 MR NEUKOM: Objection; document speaks for 12:45PM

23 itself, and to the extent it doesn't, calls for opinion 12:45PM

24 testimony 12:45PM

25 THE WITNESS: Yeah, it -- so this does reference 12:45PM

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1 the OSPF standard, a newer version than what you have 12:45PM

2 shown me, and it talks about if you are compliant to 12:45PM

3 that version, that implementation could use BFD 12:45PM

4 services 12:45PM

5 BY MR SILBERT: 12:45PM

6 Q Okay What resources did you use when naming the 12:45PM

7 "ip ospf bfd" command? 12:46PM

8 MR NEUKOM: Objection; vague 12:46PM

9 THE WITNESS: By "resources" you are implying 12:46PM

10 what type of material documents, those kind of things? 12:46PM

11 MR SILBERT: Correct 12:46PM

12 THE WITNESS: I had looked at the specification, 12:46PM

13 of course It -- I don't know if it was this version or 12:46PM

14 if it was an earlier version of -- of the BFD protocol 12:46PM

15 specification, and beyond that, it may have been some 12:46PM

16 conversation about who wants it, but I don't have any 12:46PM

17 specific recollection was there a formal Product 12:46PM

18 Requirement Document also written with it 12:46PM

19 BY MR SILBERT: 12:46PM

20 Q What do you mean when you say "some conversation 12:47PM

21 about who wants it"? 12:47PM

22 A Yes As I was saying earlier, most of the things 12:47PM

23 we implement are of two categories, typically 12:47PM

24 One is customer-driven, which is, you are talking 12:47PM

25 to certain customers They are telling you they want 12:47PM

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1 this type of technology Then you try to build that 12:47PM

2 technology 12:47PM

3 Or they are innovation-driven, which is we want 12:47PM

4 to showcase some new things which we have built, and 12:47PM

5 they are more outwards 12:47PM

6 In the latter, you will not have a customer 12:47PM

7 requirement document -- or Product Requirement Document 12:47PM

8 because there is -- nobody has requested at this point 12:47PM

9 versus, in the former case, you will have some level of 12:47PM

10 conversation, communication, or perhaps a more formal 12:47PM

11 document which describes what a customer really intends 12:47PM

12 to do 12:47PM

13 Q In the case of customer-driven developments, do 12:47PM

14 customers ever suggest CLI commands? 12:48PM

15 MR NEUKOM: Objection; vague, compound, phrased 12:48PM

16 in the subjunctive 12:48PM

17 MR SILBERT: Now you got me 12:48PM

18 THE WITNESS: Is that -- is that in reference to 12:48PM

19 this command in particular, or is it -- 12:48PM

20 MR SILBERT: No I was asking you more 12:48PM

21 generally 12:48PM

22 THE WITNESS: Okay You are asking for my 12:48PM

23 opinion? 12:48PM

24 MR SILBERT: I'm asking for your personal 12:48PM

25 knowledge 12:48PM

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| | |
|---|---|
| 1     THE WITNESS: Okay  I mean, from -- I mean, this  12:48PM | 1  some other command?                    12:51PM |
| 2  is probably a more broader comment  I don't recall  12:48PM | 2     MR NEUKOM: Objection; vague and compound   12:51PM |
| 3  seeing any specifics of what command somebody should  12:48PM | 3     THE WITNESS: I don't recall if we -- if we ever  12:51PM |
| 4  implement  They typically talk about the customer wants 12:48PM | 4  had multiple iterations on this particular command  In  12:51PM |
| 5  to get this functionality, not how Cisco should      12:48PM | 5  the slightly longer context is OSPF Version 3 was     12:52PM |
| 6  implement from the CLI perspective  That will be rare  12:48PM | 6  inspired and seeded with some of the same concepts we  12:52PM |
| 7  if somebody even ventures into that             12:48PM | 7  had in OSPF Version 2, so when we designed the CLI, it  12:52PM |
| 8  BY MR SILBERT:                        12:48PM | 8  was actually more to align how OSPF Version 2 things are 12:52PM |
| 9    Q  Are you aware of Cisco customers providing any   12:49PM | 9  structured and -- yeah                   12:52PM |
| 10  feedback on CLI commands?                12:49PM | 10  BY MR SILBERT:                       12:52PM |
| 11     MR NEUKOM: Same objections; vague, compound   12:49PM | 11    Q  So -- right                     12:52PM |
| 12     THE WITNESS: I'm not aware of anything in      12:49PM | 12     What -- tell me why you are referring to OSPF   12:52PM |
| 13  particular                           12:49PM | 13  Version 3?                         12:52PM |
| 14  BY MR SILBERT:                        12:49PM | 14    A  So IPv6 OSPF is -- what is referred to as OSPF  12:52PM |
| 15    Q  Are you aware of anything in general?       12:49PM | 15  Version 3  So, again, the longer story there is OSPF   12:52PM |
| 16    A  We do something called "early field trial," which  12:49PM | 16  had a first version -- I should say second version, OSPF  12:52PM |
| 17  typically happens if a new product goes out or a new    12:49PM | 17  second -- Version 2 was the real version which most    12:52PM |
| 18  software release goes out  Customers will typically try 12:49PM | 18  people actually implemented and deployed  That only     12:52PM |
| 19  your functionality and give you feedback in terms of how  12:49PM | 19  supported IP Version 4 prefix routing          12:52PM |
| 20  they want to change the functionality, if it is not     12:49PM | 20     When IP Version 6 became popular, OSPF had to    12:53PM |
| 21  meeting their exact functional needs  So we get      12:49PM | 21  reinvent itself, and OSPF Version 3 came along, which is 12:53PM |
| 22  feedbacks on -- on that type of thing; that, "I asked    12:49PM | 22  a separate Internet -- Internet RFC, right?       12:53PM |
| 23  you to do this, but your thing is doing slightly      12:49PM | 23     So if you look at RFC OSPF Version 3, it came    12:53PM |
| 24  different  Can you change the behavior of that?"     12:49PM | 24  later when IPv6 work was happening  So if you see     12:53PM |
| 25     Command line kind of thing, customers don't care  12:49PM | 25  things which are referred to IPv6 OSPF, they are     12:53PM |
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| | |
|---|---|
| 1  They don't want to get into  Cisco does what Cisco    12:49PM | 1  referring to OSPF Version 3  We could have chosen to   12:53PM |
| 2  does                              12:50PM | 2  call it OSPFv3, or OSPF Version 3  We chose to call it  12:53PM |
| 3    Q  Okay  Let's go back to Exhibit 54, and could you  12:50PM | 3  IPv6 OSPF in our command syntax             12:53PM |
| 4  please turn to page 16                   12:50PM | 4    Q  So before you named the IPv6 OSPF area command,   12:53PM |
| 5     Do you see the command "IPv6 ospf area"?  It's    12:50PM | 5  Cisco already used a command with a name "ip ospf area";  12:53PM |
| 6  third from the bottom                    12:50PM | 6  correct?                          12:53PM |
| 7    A  Yes                          12:50PM | 7    A  That is correct                  12:53PM |
| 8    Q  And you are indicated as the author, slash,      12:50PM | 8    Q  Okay                         12:53PM |
| 9  originator with respect to that command; is that      12:50PM | 9    A  And "ip ospf" there referred to OSPF Version 2   12:53PM |
| 10  correct?                           12:50PM | 10    Q  Right                        12:53PM |
| 11    A  Yes                          12:50PM | 11     And IPv6 refers to Version 6 of the IP protocol;  12:53PM |
| 12    Q  Did you come up with the expression "IPv6 ospf    12:50PM | 12  correct?                          12:54PM |
| 13  area"?                            12:50PM | 13    A  IP version -- yes  IPv6 refers to Version 6 of   12:54PM |
| 14    A  Yes  So -- yes  I mean, the answer is yes      12:50PM | 14  the IP protocol, which is a different Internet RFC     12:54PM |
| 15    Q  You, personally, did that, or you were part of a 12:50PM | 15    Q  Right                        12:54PM |
| 16  team that did that?                     12:50PM | 16     And -- and in that RFC -- and I'm happy to show   12:54PM |
| 17    A  So that's what I was thinking  It was -- it was  12:51PM | 17  it to you if you want -- the -- it uses -- that RFC uses 12:54PM |
| 18  a set of people, but I was the lead developer, so I     12:51PM | 18  the acronym IPv6; correct?                12:54PM |
| 19  wrote the initial functional spec, initial design and    12:51PM | 19    A  I don't recall if it does or does not        12:54PM |
| 20  initial user interface, but there were different      12:51PM | 20     (Exhibit 58 was marked for             12:54PM |
| 21  implementer -- implementers who were part of the       12:51PM | 21     identification by the Court Reporter )       12:54PM |
| 22  project, so they helped code it, basically        12:51PM | 22  BY MR SILBERT:                       12:54PM |
| 23    Q  Okay  And do you know whether, in the initial   12:51PM | 23    Q  Mr Roy, would you please look at Exhibit 58 and  12:55PM |
| 24  functional spec and design and user interface, the     12:51PM | 24  tell me if you recognize it                12:55PM |
| 25  command that you proposed was "IPv6 ospf area" versus   12:51PM | 25    A  Yes, I do                      12:55PM |
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| | |
|---|---|
| 1 Q What is it? 12:55PM | 1 is done, go with it. 12:58PM |
| 2 A This is an RFC which captures all the 12:55PM | 2 Some of the other ways to do that could be, you 12:58PM |
| 3 specifications for Internet Protocol Version 6. 12:55PM | 3 could just say "ospfv3 area." We chose to call it "ipv6 12:58PM |
| 4 Q Okay. And the title is "Internet Protocol 12:55PM | 4 ospf area." 12:59PM |
| 5 Version 6 (IPv6) Specification"; correct? 12:55PM | 5 BY MR. SILBERT: 12:59PM |
| 6 A That is correct. 12:55PM | 6 Q And -- and did you model the command "ipv6 ospf 12:59PM |
| 7 Q Okay. And does this refresh your recollection 12:55PM | 7 area" on the pre-existing command "ip ospf area"? 12:59PM |
| 8 that the Internet Protocol Version 6 specification 12:55PM | 8 MR. NEUKOM: Objection; vague. 12:59PM |
| 9 itself uses the acronym IPv6? 12:55PM | 9 THE WITNESS: The pre-existence of "ip ospf area" 12:59PM |
| 10 A This document does introduce the acronym IPv6, 12:55PM | 10 was a strong motivator for us to converge on this 12:59PM |
| 11 again, for the purposes of making the document more 12:55PM | 11 choice. 12:59PM |
| 12 readable and not having to expand Internet Protocol 12:56PM | 12 BY MR. SILBERT: 12:59PM |
| 13 Version 6 everywhere. 12:56PM | 13 Q Okay. Who else was on the team that -- I mean, I 12:59PM |
| 14 Q And in the command "ipv6 ospf area," the term 12:56PM | 14 understand you are saying you -- you did come up with 12:59PM |
| 15 "ipv6" refers to this protocol, Exhibit 58; correct? 12:56PM | 15 this command, but who else was on the team with you at 12:59PM |
| 16 A The term IP -- yes, "ipv6" refers to the Internet 12:56PM | 16 the time you came up with this command? And by "this 12:59PM |
| 17 Protocol Version 6, which is described in this RFC. 12:56PM | 17 command," I'm referring to "ipv6 ospf area." 12:59PM |
| 18 Q Okay. And in the command "ipv6 ospf area," the 12:56PM | 18 A I think there were multiple engineers. I can't 12:59PM |
| 19 term "ospf" refers to the OSPF standard published by the 12:56PM | 19 recollect the exact names at this point. 01:00PM |
| 20 IETF; correct? 12:56PM | 20 Q Okay. Let's move on. 01:00PM |
| 21 A Not really. So if you just say "OSPF," you might 12:56PM | 21 Do you still have page 16 of Exhibit 54 in front 01:00PM |
| 22 think OSPF Version 2, and that's where you have to see 12:56PM | 22 of you? 01:00PM |
| 23 the whole context of what we are talking about. 12:56PM | 23 A Yes, I do. 01:00PM |
| 24 IPv6 OSPF is OSPF Version 3. So these two words 12:57PM | 24 Q Next is "ipv6 ospf cost." 01:00PM |
| 25 combined, IPv6 and OSPF, actually tells you to look at a 12:57PM | 25 Do you see that, second from the bottom? 01:00PM |
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| | |
|---|---|
| 1 different RFC, which is the OSPF Version 3 RFC, but if 12:57PM | 1 A Yes, I do. 01:00PM |
| 2 you just told me "OSPF," I would have interpreted it as 12:57PM | 2 Q And, again, you are indicated as the author, 01:00PM |
| 3 you mean OSPF Version 2, which is a different RFC, just 12:57PM | 3 slash, originator with respect to that command 01:00PM |
| 4 for semantics 12:57PM | 4 expression. 01:00PM |
| 5 Q Understood, and you explained to me previously 12:57PM | 5 Do you see that? 01:00PM |
| 6 that the reason OSPF Version 3 was developed was to 12:57PM | 6 A Yes. 01:00PM |
| 7 accommodate IPv6; correct? 12:57PM | 7 MR. NEUKOM: Objection; misstates -- 01:00PM |
| 8 A That's correct 12:57PM | 8 mischaracterizes the document. 01:01PM |
| 9 Q Okay And we may have discussed this earlier, 12:57PM | 9 BY MR. SILBERT: 01:01PM |
| 10 but area is a parameter that's introduced in the OSPF 12:57PM | 10 Q Okay. You and Cisco are indicated as the author, 01:01PM |
| 11 specification; correct? 12:57PM | 11 slash, originator; is that correct? 01:01PM |
| 12 A Area is a collection or a cluster of devices 12:57PM | 12 A Yeah, that's correct. 01:01PM |
| 13 That concept does exist in -- in the RFCs, yes 12:57PM | 13 Q And did you come up with the expression "ipv6 01:01PM |
| 14 Q Okay And the RFCs refer to it as "area"; right? 12:57PM | 14 ospf cost"? 01:01PM |
| 15 A RFC documents does use the word "area," yes 12:57PM | 15 A Yeah, it's the same. If you see the document, 01:01PM |
| 16 Q Okay Is it a fair statement that when you came 12:58PM | 16 which it lists the EK number, it's part of the same 01:01PM |
| 17 up with the command "ipv6 ospf area," what you did was 12:58PM | 17 document, so this and anything which talks about IPv6 01:01PM |
| 18 refer to the pre-existing command "ip ospf area" and 12:58PM | 18 OSPF is all part of sort of one development deferred, 01:01PM |
| 19 changed the "ip" to "ipv6" because you were now dealing 12:58PM | 19 and all those commands pretty much follow the same 01:01PM |
| 20 with the IP Version 6? 12:58PM | 20 paradigm. 01:01PM |
| 21 MR NEUKOM: Objection; vague and compound 12:58PM | 21 But to answer your specific question, yes, I 01:01PM |
| 22 THE WITNESS: So we looked at -- we looked at 12:58PM | 22 wrote that document and pretty much came up with the 01:01PM |
| 23 what is existing in -- in Cisco IOS implementation, and 12:58PM | 23 whole IPv6 OSPF command set. 01:01PM |
| 24 that, generally, is one of the overriding things; that 12:58PM | 24 Q And we can go through these one by one, and I 01:01PM |
| 25 don't reinvent the wheel If there is something which 12:58PM | 25 suspect we will, but isn't it true that for every 01:01PM |
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| | |
|---|---|
| 1 command for which your name appears in the    01:01PM | 1 A Yes, I see that    01:05PM |
| 2 author/originator column that starts with "ipv6," that   01:02PM | 2 Q So do you agree that the OSPF specification    01:05PM |
| 3 command is identical to a pre-existing command, with the   01:02PM | 3 describes cost as a parameter that the system    01:05PM |
| 4 only difference that the pre-existing command used "ip"   01:02PM | 4 administrator can configure?    01:05PM |
| 5 instead of "ipv6"?    01:02PM | 5    MR. NEUKOM: Objection; document speaks for    01:05PM |
| 6    MR. NEUKOM: Objection; vague, compound.    01:02PM | 6 itself To the extent it doesn't, calls for opinion    01:05PM |
| 7    THE WITNESS: So I'll have to see the -- the    01:02PM | 7    THE WITNESS: So document is using the language   01:05PM |
| 8 complete list of commands to make that statement. I'm   01:02PM | 8 with the word "cost " Now, you could use cost metric, a 01:06PM |
| 9 not sure if this has the complete list, but if you have   01:02PM | 9 number, but I do structurally see what you mean I    01:06PM |
| 10 the both -- the command set --    01:02PM | 10 don't think the document, at least this paragraph, talks   01:06PM |
| 11 BY MR. SILBERT:    01:02PM | 11 about you must call it cost, if that makes sense    01:06PM |
| 12 Q Well, you do have it in front of you in this    01:02PM | 12 BY MR. SILBERT:    01:06PM |
| 13 large document, but I don't know that it's the best use   01:02PM | 13 Q Okay The standard doesn't say you must call it   01:06PM |
| 14 of our collective time to -- for you to go point by    01:02PM | 14 cost, but the standard does call it "cost"; right?    01:06PM |
| 15 point.    01:02PM | 15 A The document does use the word "cost" to refer to 01:06PM |
| 16 A Sure.    01:02PM | 16 that, yes    01:06PM |
| 17 Q With respect to specifically the command "ipv6    01:02PM | 17 Q And that's the same word that you use in the    01:06PM |
| 18 ospf cost," did you model that on a pre-existing command 01:02PM | 18 command "ip ospf cost"; right?    01:06PM |
| 19 used at Cisco, "ip ospf cost"?    01:02PM | 19 A We have used the word "cost "    01:06PM |
| 20 A Yes, that is correct.    01:03PM | 20 Q Same word that's in the standard?    01:06PM |
| 21 Q Okay. And in the command, "ipv6" refers to    01:03PM | 21 A The two words are the same    01:06PM |
| 22 Version 6 of the IP standard that's specified by the    01:03PM | 22 Q Yes    01:06PM |
| 23 IETF; correct?    01:03PM | 23    Let's go on I suspect that your explanation is 01 07PM |
| 24 A Correct. "ipv6" refers to Internet Protocol    01:03PM | 24 going to be similar for this group of IPv6 commands    01:07PM |
| 25 Version 6 as specified in the RFC.    01:03PM | 25 A Yeah    01:07PM |
| Page 110 | Page 112 |
| 1 Q Right.    01:03PM | 1 Q But for the sake of the record, I think we need   01:07PM |
| 2    And in the command "ipv6 ospf cost," "ospf"    01:03PM | 2 to just cover them all.    01:07PM |
| 3 refers to Version 3 of the OSPF standard that's    01:03PM | 3 A Yeah, please.    01:07PM |
| 4 specified by the IETF; correct?    01:03PM | 4 Q If you go back to Exhibit 54, we are looking at   01:07PM |
| 5 A Correct. In this context, "ipv6" refers to    01:03PM | 5 page 16.    01:07PM |
| 6 Version 3 of Internet RFC, yes.    01:04PM | 6    Do you see the last entry there in the "Command    01:07PM |
| 7 Q And cost is a parameter that's described in the   01:04PM | 7 Expression" column is "ipv6 ospf dead-interval"?    01:07PM |
| 8 OSPF specification; correct?    01:04PM | 8 A Yes.    01:07PM |
| 9 A I have to refer to that, if you have handy, if    01:04PM | 9 Q Okay. And do you see that Cisco and you are    01:07PM |
| 10 you can point me.    01:04PM | 10 indicated as the author, slash, originator with respect   01:07PM |
| 11 Q Sure.    01:04PM | 11 to that command expression?    01:07PM |
| 12    So if you go to the OSPF specification, which is   01:04PM | 12 A Yes.    01:07PM |
| 13 RFC 1131, which is Exhibit --    01:04PM | 13 Q Did you come up with the expression "ipv6 ospf    01:07PM |
| 14 A 56.    01:04PM | 14 dead-interval"?    01:07PM |
| 15 Q -- 56 --    01:04PM | 15 A Yes, I did.    01:07PM |
| 16 A Yeah.    01:05PM | 16 Q And when you came up with the expression "ipv6    01:07PM |
| 17 Q -- and look at the page that ends with the Bates 01:05PM | 17 ospf dead-interval," did you model it on a pre-existing   01:08PM |
| 18 No. 6007.    01:05PM | 18 command with the name "ip ospf dead-interval"?    01:08PM |
| 19 A 6007. Okay.    01:05PM | 19 A Yes. That was the dominant decision-maker, yes. 01:08PM |
| 20 Q I'm looking at the first full paragraph at the    01:05PM | 20 Q Okay. And in the command "ipv6 ospf    01:08PM |
| 21 top of that page.    01:05PM | 21 dead-interval," "ipv6" refers to Internet Protocol    01:08PM |
| 22    Do you see where it says, "A cost is associated    01:05PM | 22 Version 6 as specified by the IETF; correct?    01:08PM |
| 23 with the output side of each router interface. This    01:05PM | 23 A Yes. It refers to Internet Protocol Version 6 as 01:08PM |
| 24 cost is configurable by the system administrator."    01:05PM | 24 specified in Internet RFC.    01:08PM |
| 25    Do you see that?    01:05PM | 25 Q And in the command "ipv6 ospf dead-interval," the 01:08PM |
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| | |
|---|---|
| 1 term "ospf" refers to the OSPF Version 3 standard 01:08PM | 1 Version 2, or the IP OSPF, and, again, we have kept the 01:12PM |
| 2 specified by the IETF; correct? 01:09PM | 2 same flow and same -- same syntax 01:12PM |
| 3 A Yes. In this context, "ipv6 ospf" refers to the 01:09PM | 3 MR SILBERT: Right 01:12PM |
| 4 OSPF Version 3 specification as specified in an Internet 01:09PM | 4 Q And so just, if I understand your testimony 01:12PM |
| 5 RFC. 01:09PM | 5 correctly, you are saying that where the specification 01:12PM |
| 6 Q Okay. And a dead interval is a parameter that's 01:09PM | 6 uses the term "dead," space "interval," the command uses 01:12PM |
| 7 described in the OSPF specification; right? 01:09PM | 7 the term "dead," hyphen, "interval"? 01:12PM |
| 8 A Not sure if you have -- do you have -- 01:09PM | 8 MR NEUKOM: Objection; misstates the document -- 01:12PM |
| 9 Q Yeah. It's, again, looking at the -- oh, that's 01:09PM | 9 or, pardon me, prior testimony and mischaracterizes the 01:12PM |
| 10 the wrong one. The OSPF specification, which I should 01:09PM | 10 document 01:12PM |
| 11 just keep in front of me -- okay, 56. 01:09PM | 11 THE WITNESS: Yeah, so the Internet specification 01:12PM |
| 12 A Yeah. Yeah. 01:09PM | 12 uses multiple ways It does use a variant, which is 01:12PM |
| 13 Q And please look at the page that ends in Bates 01:09PM | 13 dead, space, interval It also uses DeadInt 01:12PM |
| 14 No. 683. 01:09PM | 14 The Cisco implementation of IPv6 OSPF uses dead, 01:12PM |
| 15 Do you see the section with the heading "A.4 The 01:10PM | 15 hyphen, interval 01:12PM |
| 16 Hello packet"? 01:10PM | 16 BY MR SILBERT: 01:12PM |
| 17 A Yes. 01:10PM | 17 Q Okay Just -- just so we can save a little time, 01:12PM |
| 18 Q I'm reading at the beginning of the second 01:10PM | 18 do you -- and when we get to the next term, do you agree 01:13PM |
| 19 paragraph. Do you see where it says: "All routers 01:10PM | 19 that the OSPF specification describes something 01:13PM |
| 20 connected to a common network must agree on certain 01:10PM | 20 called -- a parameter called a Hello interval? 01:13PM |
| 21 parameters (network mask, hello and dead intervals)." 01:10PM | 21 A So on the same page, your 683, if you look at the 01:13PM |
| 22 Do you see that? 01:10PM | 22 packet, there is something called HelloInt, which is 01:13PM |
| 23 A Yes, I see that. 01:10PM | 23 Hello interval 01:13PM |
| 24 Q Okay. So do you agree that a dead interval is a 01:10PM | 24 Q Right 01:13PM |
| 25 parameter that's described in the OSPF specification? 01:10PM | 25 And also in the sentence above that I read 01:13PM |
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| | |
|---|---|
| 1 MR NEUKOM: Objection; document speaks for 01:10PM | 1 previously, it says, "All routers connected to a common 01:13PM |
| 2 itself 01:10PM | 2 network must agree on certain parameters (network mask, 01:13PM |
| 3 THE WITNESS: So if you -- if you look at the 01:10PM | 3 hello and dead intervals)"; right? 01:13PM |
| 4 packet from that picture, there is one which is called 01:10PM | 4 A Yes, that's another reference to it 01:13PM |
| 5 "DeadInt," and that's the packet format, and the 01:10PM | 5 Q Okay Who else was on the team with you when you 01:13PM |
| 6 document does refer to as "DeadInt," or dead interval, 01:11PM | 6 came up with the expression "ipv6 ospf dead-interval"? 01:14PM |
| 7 in multiple places 01:11PM | 7 A It's the same set of people, but I don't remember 01:14PM |
| 8 MR SILBERT: Right 01:11PM | 8 a specific name at this point Pretty much all of this 01:14PM |
| 9 Q Okay So in the command "ipv6 ospf 01:11PM | 9 IPv6 OSPF command we did together at the same time 01:14PM |
| 10 dead-interval," you are referring to the dead interval 01:11PM | 10 Q Okay So is that -- 01:14PM |
| 11 parameter using the same term that's used in the OSPF 01:11PM | 11 A Same answer as before 01:14PM |
| 12 specification; right? 01:11PM | 12 Q Let me just ask you, and if it's not fair, just 01:14PM |
| 13 MR NEUKOM: Objection; mischaracterizes the 01:11PM | 13 say so, but is that answer going to be true for every 01:14PM |
| 14 document 01:11PM | 14 one of these IPv6 OSPF commands? 01:14PM |
| 15 THE WITNESS: So dead, dash, interval, at least 01:11PM | 15 A That is correct 01:14PM |
| 16 from the quick scan, I'm not seeing that in the 01:11PM | 16 Q Okay 01:14PM |
| 17 document The document does use "DeadInt," or dead, 01:11PM | 17 A It's all done together, one time 01:14PM |
| 18 space, interval, some of the other variants 01:11PM | 18 Q Okay Okay Let's just move to the next 01:14PM |
| 19 BY MR SILBERT: 01:11PM | 19 command, which is "ipv6 ospf hello-interval " We are 01:14PM |
| 20 Q Okay So the variation in the command that you 01:11PM | 20 now on the next page of Exhibit 54, page 17 01:14PM |
| 21 have identified is that you added a hyphen; right? 01:11PM | 21 Do you see that? 01:14PM |
| 22 MR NEUKOM: Objection; misstates the document 01:11PM | 22 A Yes 01:14PM |
| 23 and misstates his prior testimony 01:11PM | 23 Q And Cisco and you, again, are indicated as the 01:14PM |
| 24 THE WITNESS: Dead, hyphen, interval is how we 01:12PM | 24 author, slash, originator with respect to that command 01:14PM |
| 25 had implemented a similar command in -- in OSPF 01:12PM | 25 Do you see that? 01:14PM |
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30 (Pages 114 - 117)

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| | |
|---|---|
| 1 A Yes.                                     01:14PM | 1 Q Okay So other than the hyphen, there's --     01:17PM |
| 2     MR. NEUKOM: Objection; mischaracterizes the     01:14PM | 2 again, there's a difference here because     01:17PM |
| 3 document.                                 01:14PM | 3 "hello-interval," in the command expression, is     01:17PM |
| 4     MR. SILBERT: Man. Okay.               01:15PM | 4 hyphenated, and the term "Hello interval" in the -- in   01:17PM |
| 5 Q And did you come up with the expression "ipv6   01:15PM | 5 the specification has a space instead of a hyphen; is   01:17PM |
| 6 ospf hello-interval"?                        01:15PM | 6 that -- is that it?                         01:17PM |
| 7 A Yes. I think we are repeating it for all      01:15PM | 7     MR NEUKOM: Objection; mischaracterizes the     01:17PM |
| 8 commands. It's one document. It was all done together,  01:15PM | 8 document                              01:17PM |
| 9 but that's it.                             01:15PM | 9     THE WITNESS: This command implements the     01:17PM |
| 10 Q Okay. Fair -- fair enough.             01:15PM | 10 functionality as specified by either HelloInt or Hello,  01:17PM |
| 11     When you --                          01:15PM | 11 space, interval                           01:17PM |
| 12     MR. NEUKOM: To be clear -- sorry -- this is a   01:15PM | 12 BY MR SILBERT:                         01:17PM |
| 13 comment generally intended to be helpful. I think when  01:15PM | 13 Q Okay All right Let's just keep going       01:17PM |
| 14 the witness is saying it's all one document, he's not   01:15PM | 14     "Ipv6 ospf network," which is the next command on  01:17PM |
| 15 referring to Exhibit 54. He's, rather, talking to the   01:15PM | 15 page 17 of Exhibit 54, again, you came up with that    01:18PM |
| 16 Bates-stamp number, which is included in the        01:15PM | 16 command expression; is that correct?          01:18PM |
| 17 earliest-known document.                   01:15PM | 17 A Yes. I did                            01:18PM |
| 18     MR. SILBERT: Yeah, yeah, I understand what he's  01:15PM | 18 Q And when you came up with the command expression  01:18PM |
| 19 referring to.                            01:15PM | 19 "ipv6 ospf network," did you model it on a pre-existing  01:18PM |
| 20     MR. NEUKOM: Okay.                   01:15PM | 20 command with a name "ip ospf network"?         01:18PM |
| 21 BY MR. SILBERT:                        01:15PM | 21 A Yes That is the dominant reason to make this    01:18PM |
| 22 Q When you came up with the expression "ipv6 ospf  01:15PM | 22 choice                               01:18PM |
| 23 hello-interval," did you model it on a pre-existing    01:15PM | 23 Q Okay And what's the function of this command,   01:18PM |
| 24 command with a name "ip ospf hello interval"?      01:15PM | 24 incidentally, "ipv6 ospf network"?           01:18PM |
| 25 A Yeah, it's the same answer. That was our      01:15PM | 25 A So this is a interface scope command  Interfaces 01:18PM |
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| | |
|---|---|
| 1 dominant reason to choose this set of keywords.      01:16PM | 1 are of different type. There are interfaces which are   01:19PM |
| 2 Q And in the command "ipv6 ospf hello-interval,"    01:16PM | 2 used to connect two devices together, which are known as 01:19PM |
| 3 does "ipv6" refer to Internet Protocol Version 6 as    01:16PM | 3 point-to-point interfaces, or there are interfaces which  01:19PM |
| 4 specified by the IETF?                       01:16PM | 4 are used to connect one to many. Those are broadcast    01:19PM |
| 5 A Yes, and "ipv6" refers to Internet Protocol     01:16PM | 5 interfaces, and there are others. I'll not get into the  01:19PM |
| 6 Version 6 RFC --                          01:16PM | 6 comprehensive list.                        01:19PM |
| 7 Q Okay -- sorry, I didn't mean to interrupt you.   01:16PM | 7     This command will let you choose what type of    01:19PM |
| 8 A That's okay.                          01:16PM | 8 network you are connecting to. Are you connecting to,   01:19PM |
| 9 Q And in the command "ipv6 ospf hello-interval,"    01:16PM | 9 again, a point-to-point-type circuit or a broadcast-type 01:19PM |
| 10 does the term "ospf" refer to OSPF Version 3 as      01:16PM | 10 circuit or other possible types of circuit?        01:19PM |
| 11 specified by the IETF?                      01:16PM | 11 Q Okay. And choosing what type of network you are  01:19PM |
| 12 A Yes. In the context of IPv6 OSPF, it refers to   01:16PM | 12 connecting to is something that's described in the OSPF  01:19PM |
| 13 OSPF Version 3, which is an RFC.             01:16PM | 13 standard; is that correct?                   01:19PM |
| 14 Q Okay. And in the command "ipv6 ospf           01:16PM | 14 A OSPF standard describes procedure for different   01:19PM |
| 15 hello-interval," does "hello-interval" refer to a    01:16PM | 15 type of interconnections. So, for example, there -- I   01:20PM |
| 16 parameter that the OSPF specification describes as a    01:16PM | 16 can look deeper into it, but there might be sections     01:20PM |
| 17 Hello interval?                          01:17PM | 17 which will describe if you are connecting in a        01:20PM |
| 18     MR. NEUKOM: Objection; mischaracterizes the     01:17PM | 18 point-to-point sense, these are the procedures you      01:20PM |
| 19 document.                                 01:17PM | 19 should be implementing, or if you are -- if you are     01:20PM |
| 20     THE WITNESS: So Hello, hyphen, interval, you can 01:17PM | 20 connecting to a one-too-many-type circuit, these are the 01:20PM |
| 21 map it to what the -- the RFC is saying in terms of    01:17PM | 21 procedures you should be implementing, so the RFC      01:20PM |
| 22 HelloInt or Hello, space, interval.           01:17PM | 22 describes the procedures, and we will have -- Cisco has  01:20PM |
| 23 BY MR. SILBERT:                        01:17PM | 23 CLI, which will implement that procedure in the back    01:20PM |
| 24 Q Okay. So --                          01:17PM | 24 end.                                 01:20PM |
| 25 A They are implying the same thing.          01:17PM | 25 Q Okay. Could you -- do you have the OSPF       01:20PM |
| Page 119 | Page 121 |

31 (Pages 118 - 121)

| | | |
|---|---|---|
| 1 | A   So -- | 04:46PM |
| 2 | Q   Thank you | 04:46PM |
| 3 | A   -- so the enclosure title "Description" was | 04:46PM |
| 4 | written by Friedman, and this describes what he has | 04:46PM |
| 5 | suggested, so I'm basing on this document | 04:47PM |
| 6 | Q   Okay   Other than what you read in that document, | 04:47PM |
| 7 | do you know anything else about the origination of the | 04:47PM |
| 8 | command expression "ip ospf authentication"? | 04:47PM |
| 9 | A   No | 04:47PM |
| 10 | MR SILBERT:  Okay   Then thank you   At this | 04:47PM |
| 11 | point, again, subject to any redirect based on | 04:47PM |
| 12 | questioning by your counsel, I thank you very much for | 04:47PM |
| 13 | your time and attention, and I'm concluding the | 04:47PM |
| 14 | deposition | 04:47PM |
| 15 | THE WITNESS:  Sure   Thanks | 04:47PM |
| 16 | MR NEUKOM:  No direct | 04:47PM |
| 17 | THE VIDEOGRAPHER:  Okay | 04:47PM |
| 18 | MR NEUKOM:  At this time | 04:47PM |
| 19 | THE VIDEOGRAPHER:  This concludes today's | 04:47PM |
| 20 | deposition of Abhay Roy   The number of media used was | 04:47PM |
| 21 | three and will be retained by Veritext Legal Solutions | 04:47PM |
| 22 | The time is 4:47 p m   We are off the record | 04:47PM |
| 23 | (TIME NOTED: 4:47 P M ) | |
| 24 | | |
| 25 | | |

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1
2
3      I, the undersigned, a Certified Shorthand
4   Reporter of the State of California, do hereby certify:
5      That the foregoing proceedings were taken before
6   me at the time and place herein set forth; that any
7   witnesses in the foregoing proceedings, prior to
8   testifying, were placed under oath; that a verbatim
9   record of the proceedings was made by me using machine
10   shorthand which was thereafter transcribed under my
11   direction; further, that the foregoing is an accurate
12   transcription thereof.
13      I further certify that I am neither financially
14   interested in the action nor a relative or employee of
15   any attorney or any of the parties.
16      IN WITNESS WHEREOF, I have this date subscribed
17   my name.
18
19   Dated: December 30, 2015
20
21
22
23      <%signature%>
24      RACHEL FERRIER
25      CSR No. 6948

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1      I, ABHAY ROY, do hereby declare under penalty
2   of perjury that I have read the foregoing transcript;
3   that I have made any corrections as appear noted, in
4   ink, initialed by me, or attached hereto; that my
5   testimony as contained herein, as corrected, is true and
6   correct.
7      EXECUTED this _____ day of _____,
8   2015, at _____, _____.
9         (City)            (State)
10
11
12
13
14
15
16      _____
17         ABHAY ROY
18         VOLUME 1
19
20
21
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24
25

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1                    UNITED STATES DISTRICT COURT

2                  NORTHERN DISTRICT OF CALIFORNIA

3                        SAN JOSE DIVISION

4

       - - - - - - - - - - - - - - - - - - - x    Case No.

5                                             :    5:14-cv-05344-BLF  (PSG)

                                              :

6      CISCO SYSTEMS, INC.,                    :

                                              :

7                        Plaintiff,            :

                                              :

8            vs.                               :

                                              :

9      ARISTA NETWORKS, INC.,                  :

                                              :

10                       Defendant.            :

                                              :

11     - - - - - - - - - - - - - - - - - - - x

12

13              VIDEOTAPED DEPOSITION OF GREG SATZ

14                      March 23, 2016

15        HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

16                         VOLUME 1

17

18

19

20

21     Reported by

22     Brooke R. Bohr

23     CSR No. 753

24     Job No 2272380

25     Pages 1 - 168

                                                  Page 1

| | |
|---|---|
| 1    VIDEOTAPED DEPOSITION OF GREG SATZ,<br>2  taken at the instance of the Defendant, at the<br>3  offices of TUCKER & ASSOCIATES, 605 W. Fort<br>4  Street, in the City of Boise, State of Idaho,<br>5  commencing at 10:10 a.m., on March 23, 2016,<br>6  before Brooke R. Bohr, CSR, RPR, a Notary Public<br>7  in and for the State of Idaho, pursuant to notice,<br>8  and in accordance with the applicable Rules of<br>9  Civil Procedure.<br>10<br>11     A P P E A R A N C E S<br>12 FOR PLAINTIFF<br>     John M. Neukom, Esq.<br>13  QUINN EMAMUEL URQUHART & SULLIVAN LLP<br>     50 California Street, 22nd Floor<br>14  San Francisco, CA 94111<br>     (415) 875-6320<br>15  johnneukom@quinnemanuel.com<br>16 FOR DEFENDANT<br>     Brian L. Ferrall, Esq.<br>17  KEKER & VAN NEST LLP<br>     633 Battery Street<br>18  San Francisco, CA 94111<br>     (415) 391-5400<br>19  bferrall@kvn.com<br>20<br>21<br>22<br>23<br>24<br>25<br>                Page 2 | 1        BOISE, IDAHO<br>2    March 23, 2016, 10:10 a.m.<br>3<br>4    THE VIDEOGRAPHER: We are now on the record.<br>5    Please note that the microphones are<br>6  sensitive and may pick up whispering and private<br>7  conversations. Please turn off all cell phones or<br>8  place them away from the microphones as they can<br>9  interfere with the deposition audio. Recording<br>10 will continue until all parties agree to go off<br>11 record.<br>12    My name is David Cromwell, representing<br>13 Veritext. The date today is March 23, 2016, and<br>14 the time is approximately 10:10 a.m. This<br>15 deposition is being held at Tucker & Associates<br>16 located at 605 West Fort Street, Boise, Idaho<br>17 83702, and is being taken by counsel for the<br>18 defendant.<br>19    The caption of this case is Cisco<br>20 Systems, Inc. v. Arista Networks, Inc. This case<br>21 is filed in the United States District Court,<br>22 Northern District of California, San Jose<br>23 Division, Case No. 5:14-CV-05344-BLF PSG. The<br>24 name of the witness is Greg Satz.<br>25    At this time, the attorneys present in<br>                Page 4 |
| 1     W I T N E S S<br>2 GREG SATZ          Page:<br>3    Examination by Mr. Ferrall    5<br>4    Examination by Mr. Neukom    151<br>5    Further Examination by Mr. Ferrall  158<br>6<br>         * * * * *<br>7<br>8     E X H I B I T S<br>9<br>         Page:<br>10<br>11 Exhibit 400  Greg Satz LinkedIn     13<br>12 Exhibit 401  "TOPS-20 DECnet-20 Programmers   22<br>        Guide and Operations Manual"<br>13<br>  Exhibit 402  One-page Document with    36<br>14      Bates No. KL-883<br>15 Exhibit 403  Document Beginning Bates No.  69<br>        ARISTANDCA00022465<br>16<br>  Exhibit 404  Document Beginning Bates No.  84<br>17      CSI-CLI-00359132<br>18 Exhibit 405  One-page Document Bates No.  106<br>        CSI-CLI-00746924<br>19<br>  Exhibit 406  Document Bates No. CSI-CLI-01828732 112<br>20      Through Bates No. CSI-CLI-01828783<br>21 Exhibit 407  Document Beginning Bates No.  141<br>        CSI-CLI-01295215<br>22<br>23 Exhibit 408  Document Beginning Bates No.  143<br>        CSI-CLI-01295181<br>24<br>25     * * * * *<br>                Page 3 | 1  the room will identify themselves and the parties<br>2  they represent.<br>3    MR. FERRALL: Brian Ferrall of Keker &<br>4  Van Nest on behalf of Arista Networks.<br>5    MR. NEUKOM: John Neukom for the plaintiff.<br>6    THE COURT: Our court reporter, Brooke Bohr,<br>7  representing Veritext, will swear in the witness,<br>8  and we can proceed.<br>9<br>10     GREG SATZ,<br>11 produced as a witness at the instance of the<br>12 Defendant, having been first duly sworn, was<br>13 examined and testified as follows:<br>14<br>15     EXAMINATION<br>16 BY MR. FERRALL:<br>17    Q. Good morning, Mr. Satz. Can you please<br>18 state your full name.<br>19    A. Greg Leonard Satz.<br>20    Q. Mr. Satz, you are not represented by<br>21 counsel today; is that right?<br>22    A. Correct.<br>23    Q. Have you ever been deposed before?<br>24    A. I have.<br>25    Q. All right. So you know the basic<br>                Page 5 |

2 (Pages 2 - 5)

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1  did, while it had the same capability, was more
2  robust, had a higher performance capability.
3  Because as the networks evolved, you needed to be
4  able to push data faster. And Stanford's code was
5  basic. It was there to just move the data, not
6  move it with the requirements that the next few
7  years dictated. And a lot of what Kirk did was to
8  create high-speed interfaces, and that's what
9  Wellfleet showed up to compete on was could they
10  go faster than Cisco. And it created an arms
11  race, as it were. Who could go faster.
12      Q.  Now, you mentioned IETF, and I think
13  earlier today you mentioned RFCs. Can you tell me
14  what an RFC is?
15      A.  Request for comments.
16      Q.  And what's the purpose of a request for
17  comment?
18      A.  To create a protocol definition or
19  solution and to publish it as a request for
20  comments in an effort to move it forward as a
21  proposed solution and a trial solution and then a
22  committed solution, as the solution progressed
23  through a community and an implementation and a
24  trial and then some feedback. So it was an
25  engineering group. Their goal was to deliver

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1  something working. Companies would try to use it
2  as -- to competitive advantages. But the
3  standards body existed to create a level playing
4  field.
5      Q.  And did you have a view at the time as
6  to the importance of publishing technology through
7  RFCs? Well, let me strike that. That was a
8  garbled question.
9          In your experience at Cisco in the
10  early years, was the sharing of technology through
11  RFCs important to Cisco?
12      MR. NEUKOM:  Objection; vague, compound, and
13  lack of foundation.
14      THE WITNESS:  Back then it wasn't clear how
15  successful Cisco would be and/or whether we might
16  maintain or keep a competitive advantage. So
17  there really was a series of tradeoffs in the
18  decision to create an RFC and make it a community
19  effort or to create a proprietary solution and
20  then decide whether to make it an RFC later. Most
21  of the times, it was to make the customers happy.
22  If the customers wanted something documented, we
23  would typically figure out how to comply with
24  that. Later, as the company got larger and I
25  wasn't involved, managing the IETF and RFC process

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1  evolved. And I can't speak to that as much.
2      Q.  BY MR. FERRALL:  Okay. But --
3      A.  But managing that was important.
4      Q.  And just by way of example, you
5  mentioned IGRP.
6      A.  Um-hum.
7      Q.  And that was a technology that Cisco
8  chose to keep proprietary, right?
9      A.  Yes.
10      Q.  All right. And there were other
11  technologies that Cisco was involved in
12  developing, like BGP, for example?
13      A.  Right.
14      Q.  And that Cisco chose to publish RFCs
15  about, right?
16      A.  Well, Cisco didn't publish the RFCs.
17  Cisco -- a person like Kirk might be a part of the
18  team that developed BGP and then Kirk would have
19  his name on it with a Cisco title, but it wasn't
20  Cisco, it was actually Kirk. And the RFC itself
21  is an open document. So just to make that
22  distinction.
23          If there was a protocol that showed up
24  from the IETF, Cisco was typically involved.
25      Q.  And what was your involvement in

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1  IETF -- in IETF? Did you --
2      A.  I would go to the meetings and attend
3  various functions and decide, based on the
4  software responsibility I had, to participate in
5  different standards or not.
6      MR. FERRALL:  Let's mark this as the next
7  exhibit.
8      (Exhibit 403 marked.)
9      THE WITNESS:  More ancient history.
10      Q.  BY MR. FERRALL:  Yeah. So I've marked
11  as Exhibit 403 what I think is an IETF RFC for a
12  simple network management protocol, SNMP. Do you
13  recognize this, Mr. Satz?
14      A.  I do.
15      Q.  Did you have involvement in the SNMP
16  RFC?
17      A.  I did.
18      Q.  What was that involvement?
19      A.  I was just part of the working group
20  that went through the process of deciding what
21  would be done as a solution to network management.
22  And SNMP was the output.
23      Q.  Do you remember when this SNMP working
24  group began to discuss this solution?
25      A.  Probably a couple years before this

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| 1 document, at least a year. | 1 called an SNMP community. |
| 2 Q. And do you remember any particular | 2 Do you see that? |
| 3 parts that you contributed, specifically? | 3 A. Yes. |
| 4 A. I think I did an RFC for a MIB for | 4 Q. Is that consistent with your definition |
| 5 CLNS, another protocol stack that since | 5 of SNMP community that you just described? |
| 6 disappeared. | 6 A. Yeah. It's more mind-numbing when you |
| 7 Q. Was there a -- have you ever heard of | 7 see it in words. |
| 8 the term "SNMP server"? | 8 Q. I couldn't agree more. |
| 9 A. Oh, the command line, parsed for the -- | 9 A. Yeah. It turns out a lot of these |
| 10 yeah -- configuration? Um-hum. Yes, I created | 10 things are written to be really obtuse. They are |
| 11 that. | 11 not intended to be obtuse, but they have a |
| 12 Q. What's -- is there such a thing as an | 12 structure to them that when you turn it into |
| 13 SNMP server, or what does that term mean? | 13 English or a simple picture it takes a lot of this |
| 14 A. Wow. | 14 out. They tried to make a more generic |
| 15 MR. NEUKOM: Objection; lack of foundation, | 15 mathematical underpinning to a mapping that added |
| 16 calls for opinion testimony. | 16 a level of complexity that just ultimately wasn't |
| 17 THE WITNESS: I think all of that code is | 17 necessary. But they were trying to be very |
| 18 gone now. The SNMP server was the way to tell the | 18 flexible. |
| 19 router software that it was to be an SNMP -- it | 19 Q. Okay. But this notion of community as |
| 20 was to start the SNMP protocol. So it would then | 20 described in the Exhibit 403 is the same as the |
| 21 begin to listen to and process SNMP packets. And | 21 community that you understood when you -- |
| 22 it was probably one of the first commands | 22 A. I made the implementation simpler |
| 23 implemented as part of this RFC to implement it | 23 because of adding a whole layer. The idea, if I |
| 24 and create an SNMP protocol within the Cisco | 24 can remember any of this craziness, is that you |
| 25 software. | 25 would have a table of -- no different than a |
| Page 70 | Page 72 |

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| 1 MR. NEUKOM: And, Brian, I rescind my prior | 1 database in today's language -- and you could be |
| 2 objection. Pardon me. | 2 able pull out individual things. And so they |
| 3 THE WITNESS: Hey, just because I write it, | 3 wanted to be able to map authorizations to |
| 4 doesn't mean I'm the expert. | 4 individual entries in the database. And the |
| 5 MR. FERRALL: You can't -- you can't | 5 implementation I did was to make it an all or |
| 6 rescind. No rescinding objections, Mr. Neukom. | 6 nothing. Because if somebody wanted that level of |
| 7 Q. BY MR. FERRALL: What's -- what's the | 7 specificity they'd ask for it and then we'd go |
| 8 notion of community in the context of SNMP? | 8 back and put all that crazy complexity into the |
| 9 A. After a while, you start running out of | 9 code. But just because the standard made it that |
| 10 words, so you pick one that tries to create a | 10 flexible we weren't going to go that far. It was |
| 11 sense of purpose. And so "community" was an | 11 an engineering choice and cost benefit. |
| 12 attempt to describe a collection of users who | 12 Yeah, I don't know if you've ever heard |
| 13 would have a specific purpose with respect to | 13 of Vint Cerf? |
| 14 using the protocol. It was nothing more than an | 14 Q. Sure. |
| 15 authorization or an access. A password, as it | 15 A. So one of the more inspiring aspects of |
| 16 were. | 16 this work, we had three different protocols |
| 17 Q. So if you look at Page 7 of this | 17 compete to be the network management RFC, and so |
| 18 Exhibit 403. | 18 there was just three groups of engineers that were |
| 19 MR. NEUKOM: Sorry. Which page are we on? | 19 not happy, or wanted their choice. And I watched |
| 20 MR. FERRALL: Page 7. | 20 Vint come in and broker a -- mediate, and I had |
| 21 Q. BY MR. FERRALL: If you see under | 21 never seen that kind of mediation happen before, |
| 22 Section 3.2.5, Definition of Administrative | 22 let alone difficult engineers. And so it was a |
| 23 Relationships, and then the second paragraph there | 23 very inspiring time to watch somebody. And then |
| 24 says, quote, appearing of an SNMP agent with some | 24 so, you know, Vint was the author of a lot of the |
| 25 arbitrary set of SNMP application entities is | 25 TCP/IP protocols. So people respected him and |
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| 1      Exhibit 405 is a one-page document | 1     R E P O R T E R' S  C E R T I F I C A T E |
| 2  marked CSI-CLI-00746924. | 2 |
| 3      Exhibit 406 begins CSI-CLI-01828732, | 3 |
| 4  and for this document I'll read the last number | 4     I, BROOKE R. BOHR, a Notary Public in |
| 5  because I think we're all unclear whether it is | 5  and for the State of Idaho, do hereby certify: |
| 6  one versus multiple documents. This ends with | 6     That prior to being examined, the |
| 7  Bates stamp CSI-CLI-01828783. | 7  witness named in the foregoing deposition was by |
| 8      Exhibit 407 begins Bates stamp | 8  me duly sworn to testify the truth, the whole |
| 9  CSI-CLI-01295215. | 9  truth, and nothing but the truth; |
| 10     And Exhibit 408 begins | 10     That said deposition was taken down by |
| 11  CSI-CLI-01295181. | 11  me in shorthand at the time and place therein |
| 12    MR. NEUKOM: Thanks all. | 12  named and thereafter reduced into typewriting |
| 13    MR. FERRALL: Agreed. Thank you. | 13  under my direction, and that the foregoing |
| 14    (The deposition concluded at 3:31 p.m.) | 14  transcript contains a full, true, and verbatim |
| 15        -oo0oo- | 15  record of the said deposition. |
| 16 | 16     I further certify that I have no |
| 17 | 17  interest in the event of the action. |
| 18 | 18     WITNESS my hand and seal March 30, 2016. |
| 19 | 19 |
| 20 | 20 |
| 21 | 21 |
| 22 | 22 |
| 23 | 23     <%signature%> |
| 24 | 24    Brooke R. Bohr |
| 25 | 25    CSR No. 753 |
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| 1     V E R I F I C A T I O N | |
| 2    I declare under penalty of perjury | |
| 3  under the laws that the foregoing is | |
| 4  true and correct. | |
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| 6    Executed on _____ , 20___, | |
| 7  at _____, _____. | |
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| 12    _____ | |
| 13    WITNESS SIGNATURE | |
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